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1. PURPOSE

THE CORE FUNCTION TESTS TEST THE CORES, CORE READ/WRITE CIRCUITRY, AND THE CORE ADDRESSING CIRCUITRY IN THE 1131 CENTRAL PROCESSING UNIT. THE CORE FUNCTION TESTS CONSIST OF TWO PROGRAMS WHICH ARE NORMALLY LOADED AND EXECUTED IN THE FOLLOWING SEQUENCE.

A. HIGH CORE FUNCTION TEST (PID 03B0) TESTS ALL CORE LOCATIONS ABOVE ADDRESS /0B0D, AND CORE LOCATIONS /0DD0 THRU /0DD9.
B. LOW CORE FUNCTION TEST (PID 03B1) TESTS CORE LOCATIONS /0000 THRU /09DD AND THE TEN HIGHEST LOCATIONS IN CORE.

2. PREREQUISITES

2.1 PROGRAM PREREQUISITES

THE CORE FUNCTION TESTS ARE LOADED BY THE 1130 RELOCATING LOADER.

2.2 EQUIPMENT PREREQUISITES

A. 1131 CPU
B. CARD OR PAPER TAPE INPUT TO THE 1131

3. USE PROCEDURE

3.1 PROGRAM LOADING

TO LOAD FROM CARDS

A. PLACE THE RELOCATING LOADER, THE HIGH CORE TEST, AND THE LOW CORE TEST IN THE READER IN THAT ORDER. (SEE NOTE)
B. MAKE READER READY.
C. PRESS THE 1131 RESET KEY.
D. PRESS THE 1131 PROGRAM LOAD KEY.
E. IF THE PROGRAM FAILS TO LOAD OR STOPS AT A WAIT BELOW ADDRESS /0160 REFER TO THE RELOCATING LOADER DOCUMENTATION.

TO LOAD FROM PAPER TAPE

A. PLACE THE RELOCATING LOADER IN THE READER.
B. MAKE THE READER READY.
C. PRESS THE 1131 RESET KEY.
D. PRESS THE 1131 PROGRAM LOAD KEY.
E. LOADER WILL LOAD AND HALT AT WAIT 3DF6 (B REG).
F. PLACE THE HIGH CORE TEST IN THE READER. (SEE NOTE)
G. MAKE THE READER READY.
H. MANUALLY SET IAR TO /0D78.
I. SET MODE SWITCH TO RUN AND PRESS PROGRAM START.
J. IF PROGRAM FAILS TO LOAD OR STOPS AT A WAIT BELOW ADDRESS /016D REFER TO RELOCATING LOADER DOCUMENTATION.
K. AFTER HIGH CORE TEST IS LOADED, PLACE THE LOW CORE TEST TAPE IN THE READER AND MAKE READER READY.

NOTE...IF DESIRED EITHER OF THE TWO PROGRAMS MAY BE LOADED AND EXECUTED INDEPENDENTLY. IF THE PROGRAMS ARE TO BE RUN IN SEQUENCE THE HIGH CORE TEST MUST BE EXECUTED FIRST. EXECUTION OF THE LOW CORE TEST DESTROYS THE LOADER.

3.2. OPERATING PROCEDURE

A. THE HIGH CORE TEST WILL LOAD AND STOP AT WAIT 3001 (B REG). THE CORE SIZE WILL BE DISPLAYED IN THE ACCUMULATOR.
B. SET SWITCH OPTIONS IF DESIRED. (NORMAL--ALL SWS OFF)
C. PRESS PROGRAM START.
D. THE HIGH CORE TEST WILL RUN ABOUT 1 TO 5 MINUTES DEPENDING ON CORE SIZE AND, IF NO ERRORS OCCUR, STOP AT THE END OF PROGRAM WAIT 3002. SET SWITCH OPTIONS ID DESIRED AND PRESS PROGRAM START. IF SW 15 IS ON THE HIGH CORE TEST WILL BE RERUN.
E. IF SWT 15 IS OFF THE LOW CORE TEST WILL LOAD AND STOP AT WAIT 3DD1. THE CORE SIZE WILL BE DISPLAYED IN THE ACCUMULATOR.
F. SET OPTIONS IF DESIRED. (NORMAL--ALL SWS OFF)
G. PRESS PROGRAM START.
H. THE LOW CORE TEST WILL RUN ABOUT 1 MINUTE AND, IF NO ERRORS OCCUR, STOP AT THE END OF PROGRAM WAIT 3002. PRESS START TO RERUN THE LOW CORE TEST.
I. ERRORS WILL BE INDICATED BY ERROR WAITS AND PRINTOUTS.
J. PROGRAM OPTIONS MAY BE SELECTED OR CHANGED AT ANY TIME.
K. SEE SECTION 3.6 FOR RESTART PROCEDURE.

3.3 PROGRAM OPERATING OPTIONS

ALL OPTIONS EXCEPT SWT 15 APPLY TO BOTH THE HIGH AND LOW CORE TESTS.

NORMAL SWITCH SETTINGS---ALL OFF

SWT	FUNCTION
15	ON..RERUN HIGH CORE TEST WHEN START IS PRESS AT THE END OF PROGRAM WAIT (3002). OFF..LOAD LOW CORE TEST WHEN PROGRAM START IS PRESSED AT END OF PROGRAM WAIT (3002). NOTE..SWT 15 SETTING HAS NO EFFECT ON LOW CORE TEST.
14	ON..BYPASS DATA ERROR WAITS (3004 AND 3005).
13	ON..BYPASS ALL PRINTOUTS.
12	ON..LOCK ON ERROR FUNCTION. IF AN ERROR OCCURS WHILE SWITCH 12 IS ON THE FAILING FUNCTION WILL BE LOOPED CONTINUOUSLY UNTIL SWT 12 IS TURNED OFF. SWITCH MAY BE TURNED ON WHILE AT AN ERROR WAIT TO LOCK ON THE ERROR.
11	ON..LOOP ENTIRE PROGRAM. THE START AND END WAITS (3001 AND 3002) WILL BE BYPASSED.
10	ON..LOOP ROUTINE. IF A VALID ROUTINE NUMBER (1 THRU 6) IS ENTERED IN SWS 0-7 THAT ROUTINE WILL BE LOOPED CONTINOUSLY. IF NO VALID ROUTINE NUMBER IS ENTERED IN SWS 0-7 THE TEST ROUTINE WHICH IS CURRENTLY BEING EXECUTED WILL BE LOOPED. THE ROUTINE WILL BE LOOPED UNTIL SWS 0-7 ARE CHANGED OR SWITCH 10 IS TURNED OFF.
9	ON..PRINT ROUTINE START MESSSAGE. IF SWT 9 IS ON A START MESSAGE WILL BE PRINTED AT THE START OF EACH ROUTINE.
8	ON..LOCK ON ERROR ADDRESS. IF AN ERROR OCCURS WHILE SWT 8 IS ON THE PROGRAM WILL ALTERNATELY STORE THE LAST GOOD DATA AND THE LAST DATA WORD THAT FILED AT THE ADDRESS THAT FAILED. SWT 8 MAY BE TURNED ON WHILE AT AN ERROR WAIT TO LOCK ON THE ERROR.
0-7	ROUTINE NUMBER...USED WITH SWT 10 OPTION. SEE SWT 10.

3.4 PROGRAM WAITS

ALL WAITS APPLY TO BOTH THE HIGH AND LOW CORE TESTS.

3.4.1 NORMAL WAITS

WAIT NO. (B REG).	DESCRIPTION	RESTART ACTION
30F6	END OF PAPER TAPE LOADER. THIS IS AN ERROR CONDITION EXCEPT AT THE END OF PAPER TAPE LOADER. REFER TO RELOCATING LOADER DOCUMENTATION.	A. PLACE PROGRAM TAPE IN READER AND MAKE READY. B. MANUALLY SET IAR TO 0078. C. SET MODE SWT TO RUN AND PRESS PROGRAM START.
3001	START OF PROGRAM. ACCUMULATOR CONTAINS CORE SIZE.	A. SELECT OPTIONS IF DESIRED. B. PRESS PROGRAM START.
3002	END OF TEST PROGRAM.	A. SELECT OPTIONS IF DESIRED. B. PRESS PROGRAM START.

3.4.2 ERROR WAITS

WAIT NO. (B REG).	DESCRIPTION	RESTART ACTION
3003	PROGRAM COULD NOT DETERMINE CORE SIZE. WRAP-AROUND FAILURE.	PRESS PROGRAM START TO RETRY.
3004	DATA ERROR. FIRST WAIT. A REG CONTAINS INCORRECT DATA. Q REG CONTAINS CORRECT DATA.	PRESS PROGRAM START TO ADVANCE TO WAIT 3005.
3005	DATA ERROR SECOND WAIT. A REG CONTAINS ADDRESS THAT FAILED. Q REG BITS 0-7 CONTAINS RTN NO. Q REG BITS 8-15 CONTAINS FUNC. NO.	SELECT OPTIONS IF DESIRED. PRESS PROGRAM START.
3006	CONSOLE PRINTER FAILURE. SELECT BYPASS PRINT OPTION IF FAILURE PERSISTS.	PRESS PROGRAM START.
3007	ILLEGAL SWITCH COMBINATION. SWS 8, 10, AND 12 ARE OFF AND SWS 13 AND 14 ARE ON. THIS COMBINATION OF SWS WOULD PREVENT ERROR DETECTION.	CHANGE SWITCH SETTINGS. PRESS PROGRAM START.

3.5 PROGRAM TERMINATION

BOTH THE LOW AND HIGH CORE TESTS WILL TERMINATE IN A WAIT INSTRUCTION WITH 3002 INT EH B REG.

3.6 RESTART PROCEDURE

RESTART FROM ANY WAIT BY PRESSING START.

NO RESTART LINKAGE IS AVAILABLE FROM A SYSTEM RESET CONDITION. TO RESTART PROGRAM MANUALLY SET THE INSTRUCTION ADDRESS REGISTER AS SHOWN BELOW, GO TO RUN MODE, AND PRESS PROGRAM START.

HIGH CORE TEST...SET IAR TO /0161 TO RESTART.
LOW CORE TEST....SET IAR TO /0961 TO RESTART.

4. PRINTOUTS

4.1 NORMAL PRINTOUTS

START HIGH CORE TEST	THIS MESSAGE IS PRINTED AT THE START OF THE HIGH CORE TEST PROGRAM.
END HIGH CORE TEST	THIS MESSAGE IS PRINTED AT THE END OF THE HIGH CORE TEST PROGRAM.
START LOW CORE TEST	THIS MESSAGE IS PRINTED AT THE START OF THE LOW CORE TEST PROGRAM.
END LOW CORE TEST	THIS MESSAGE IS PRINTED AT THE END OF THE LOW CORE TEST PROGRAM.
START RTN XX	THIS MESSAGE IS PRINTED AT THE START OF EACH TEST ROUTINE IF SWT 9 IS TURNED ON. XX IS THE ROUTINE NUMBER.

4.2 ERROR PRINTOUTS

ERR CORE SIZE	THIS MESSAGE IS PRINTED IF THE PROGRAM IS UNABLE TO DETERMINE THE CORE SIZE. CORE WRAP-AROUND FEATURE FAILED.
ERR RTN XX FUNC YY	A DATA ERROR WAS DETECTED. XX IS THE ROUTINE NUMBER AND YY IS THE FUNCTION NUMBER. REGISTER DISPLAYS WILL PROVIDE FURTHER INFORMATION AT ERROR WAITS. SEE ERROR WAITS SECTION 3,4,2 AND ROUTINES DESCRIPTION SECTION 5.2.

5. COMMENTS

5.1 PROGRAM DESCRIPTION

THE CORE FUNCTION TEST CONSISTS OF TWO NEARLY IDENTICAL PROGRAMS. THE ONLY DIFFERENCES BETWEEN THE TWO PROGRAMS ARE THE CORE LOCATIONS INTO WHICH THEY ARE LOADED AND THE CORE LOCATIONS WHICH THEY TEST.

THE HIGH CORE TEST LOADS STARTING AT ADDRESS /0161 AND TESTS CORE FROM ADDRESS /0800 UP TO AN ADDRESS 10 LOCATIONS HIGHER THAN THE HIGHEST ADDRESS IN CORE. THIS PROCEDURE TESTS THE WRAP-AROUND FEATURE OF CORE.

THE LOW CORE TEST LOADS STARTING AT ADDRESS /0961 AND TESTS CORE STARTING AT AN ADDRESS 10 POSITIONS LOWER THAN ADDRESS /0000 UP TO ADDRESS /0900. THIS ALSO TESTS THE WRAP-AROUND FEATURE AND OVERLAPS THE AREA TESTED BY THE HIGH CORE TEST.

5.2 TEST ROUTINES DESCRIPTION

BOTH THE HIGH AND LOW CORE TESTS USE IDENTICAL TEST ROUTINES. THERE ARE SIX TEST ROUTINES AND EACH ROUTINE IS DIVIDED INTO TWO TEST FUNCTIONS. EACH TEST FUNCTION IS EXECUTED TWICE BEFORE GOING TO THE NEXT ROUTINE OR FUNCTION.

RTN 1...ONES AND ZEROS PATTERN

RTN 1 IS INITIALIZED BY FILLING CORE WITH ONES.

FUNC. 1 CHECKS THEN COMPLEMENTS EACH CORE LOCATION STARTING AT THE LOWEST ADDRESS AND PROGRESSING TOWARD THE HIGHEST.
FUNC. 2 CHECKS THEN COMPLEMENTS EACH CORE LOCATION STARTING AT THE HIGHEST ADDRESS AND PROGRESSING TOWARD THE LOWEST.

RTN 2...ADDRESSING PATTERN

RTN 2 IS INITIALIZED BY FILLING EACH CORE LOCATION WITH ITS OWN ADDRESS.

FUNC. 1 SAME AS RTN 1 FUNC 1.
FUNC. 2 SAME AS RTN 1 FUNC 2.

RTN 3...CHECKERBOARD PATTERN

RTN 3 IS INITIALIZED BY FILLING CORE WITH ALTERNATE 5555 AND AAAA CHARACTERS.

FUNC. 1 SAME AS RTN 1 FUNC 1.
FUNC. 2 SAME AS RTN 1 FUNC 2.

RTN 4...BIT ISOLATION PATTERN

RTN 4 HAS NO INITIALIZATION STEP.

FUNC. 1 FLOATING ONE PATTERN. BIT 0 IS SET ON AND ALL OTHER BITS OFF IN THE CORE LOCATION BEING TESTED. THE BIT IS THEN CHECKED AND SHIFTED RIGHT ONE POSITION SO THAT THE CORE LOCATION ALWAYS CONTAINS 15 BITS OFF AND ONE ON. ALL 16 POSITIONS OF EACH CORE LOCATION ARE CHECKED BEFORE ADVANCING TO THE NEXT CORE LOCATION.
FUNC. 2 FLOATING ZERO PATTERN. THIS TEST IS PERFORMED THE SAME AS RTN 4 FUNCTION 1 EXCEPT THAT A ZERO IS SHIFTED RIGJT KEEPING 15 BITS ON AND ONE OFF.

RTN 5...WORST CASE (MAXIMUM NOISE) PATTERN

RTN 5 IS INITIALIZED BY FILLING CORE WITH THE WORST CASE PATTERN. THIS PATTERN CONSISTS OF BLOCKS OF ONES AND ZEROS.

FUNC 1 RAPIDLY SCANS CORE CHECKING EACH CORE LOCATION.
FUNC 2 CHECKS AND COMPLEMENTS EACH CORE LOCATION FOUR TIMES BEFORE PROCEEDING TO THE NEXT ADDRESS.

RTN 6...COMPLEMENT WORST CASE PATTERN

RTN 6 IS INITIALIZED BY FILLING CORE WITH THE COMPLEMENT WORST CASE PATTERN.

FUNC. 1 SAME AS RTN 5 FUNCTION 1.
FUNC. 2 SAME AS RTN 5 FUNCTION 2.

5.3 DESCRIPTION OF OTHER ROUTINES

PROGRAM INITIALIZATION ROUTINE--DETERMINES CORE SIZE AND WAITS AT THE START OF PROGRAM WAIT.

ROUTINE SEQUENCE CONTROL ROUTINE--CHECKS SWITCH OPTIONS AND CONTROLS THE SEQUENCE IN WHICH TEST ROUTINES ARE EXECUTED.

PROGRAM END ROUTINE--CHECKS SWITCH OPTIONS AND WAITS AT THE END OF PROGRAM WAIT.

PRINT ROUTINE--PRINTS ALL MESSAGES USED BY THE PROGRAM.

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                         ABS                                                3B0DDD2D
000D                     DRG     /0160                                      3B000D3D
016D 0 03BD              DC      /D3BD       PID                            3B00DD40
                    *                                                       3BDDD050
                    ************************************************        3B00D060
                    *                                                       3BC00070
                    *            PROGRAM INITIALIZATION                     3BDDDD80
                    *                                                       3BDDD090
                    ************************************************        3B000100
                    *                                                       3B0DD110
                    *            FIND CORE SIZE                             3BDD0120
                    *                                                       3B00D130
D161 0 CD75         CRSIZ LD     H1000                                      3B0D0140
D162 D DD73              STO     SIZE        SET BK CORE SIZE               3B0D0150
0163 0 1D1D              SLA     16                                         3B000160
0164 D D4DD D0DD         STO  L  0           CLEAR ADDRS 0DD0               3BDD0170
0166 0 CC0D D3F4         LDD  L  LINK                                       3B0D01BD
0168 0 0CB0 01D6         STD  I  SIZE        STO RESTART LINKAGE            3BDD0190
016A 0 C400 0000         LD   L  0           DID WRAP-AROUND OCCUR          3BDDD2DD
016C D 4C20 0185         BSC  L  FNDSZ,Z     *YES, BRANCH                   3BDD0210
                    *                                                       3BD0D220
016E 0 C067              LD      SIZE                                       3BDDD230
016F 0 1D01              SLA     1           INCRE SIZE BY 4K               3BDD0240
0170 D D065              STO     SIZE        IS SIZE OVER 32K               3B000250
0171 D 4C10 0163         BSC  L  CRSIZ+2,-   *NO, BRANCH                   3BDDD260
                    *                                                       3B00D270
0173 D CC0D 03F4         LDD  L  LINK                                       3B000280
0175 0 DC80 01D6         STD  I  SIZE        STO RESTART LINKAGE            3BDDD290
0177 D C4DD 0000         LD   L  D           DID WRAP-AROUND OCCUR          3B0D03D0
0179 0 4C2D 0185         BSC  L  FNDSZ,Z     *YES, BRANCH                   38DD0310
                    *                                                       3BD0D320
017B 0 CC00 03F4         LDD  L  LINK                                       3BD00330
017D 0 DC00 00DD         STD  L  0                                          3BDDD340
017F D 440D 043B         BSI  L  PRINT       PRINT ERROR MSG                3BD0D350
0181 D B492              DC      MSG05+/BDD0                                3BDDD360
0182 0 048C              DC      MSG04                                      3BD0D370
                    *                                                       3BD00380
0183 0 3DD3              WAIT    3           ERR, CANNOT FIND CORE SIZE     3BDDD390
0184 0 70DC              MDX     CRSIZ       RETRY                          3BD0D400
                    *                                                       3B00D410
0185 0 C05D         FNDSZ LD     SIZE                                       3BDDD420
0186 0 9400 D2EB         S    L  H0001       CORRECT CORE SIZE              3B000430
0188 0 D04D              STO     SIZE                                       3B000440
0189 0 804E              A       H000A       ADD TEN                        3BDD0450
018A 0 D4D0 02FD         STD  L  UPRLM       SET UPPER TEST LIMIT           3B00D460
018C 0 CD49              LD      SIZE                                       3BD0047D
018D 0 3001              WAIT    1           WAIT FOR SWS, SIZE IN ACC      3B0DD480
                    *                                                       3B00D490
018E 0 4400 D43B    START BSI  L  PRINT       PRINT START MSG                3BDD05D0
0190 0 B47D              DC      MSGD1+/8DDD                                3B000510
0191 D D4B4              DC      MSGD3                                      3B0DD52D
                    *                                                       3BDDD53D
0192 0 1D1D              SLA     16                                         3BDDD540
0193 0 DD45              STO     RID                                        3BDDD55D
0194 0 040D 040D         STD  L  ERRSW                                      3BDDD56D
                    *                                                       3BDDD570
                    ************************************************        3BDDD5BD
                    *                                                       3BDDD590
                    *            ROUTINE SEQUENCE CONTROL                   3B000600
                    *                                                       3BDDD610
                    ************************************************        3BDDD620
                    *                                                       3BDDD630
0196 D 1D1D         CNTRL SLA    16                                         3BDDD640
0197 0 D4D0 0280         STO  L  ALTNT                                      3BDDD650
0199 0 D4DD D284         STO  L  PASS                                       3B000660
019B D D4D0 D282         STO  L  COMPL                                      3BDDD67D
0190 0 04D0 04DE         STO  L  FUNNO                                      3B000680
019F 0 DCD0 D3F6         XIO  L  RDSWS       READ SWS                       3BDDD690
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D1A1 0 C40D 04DF         LD   L  SWS                                        3B0D07DD
01A3 0 1805              SRA     5                                          3B000710
01A4 D 4C04 01C4         BSC  L  SLRTN,E     BR IF LOOP RTN SELECTED        3B00072D
                    *                                                       3B00073D
01A6 0 7401 01D9    ADVNC MDX  L  RID,1      ADVANCE TO NEXT RTN            3B000740
01A8 D CD3D              LD      RID                                        3B00D75D
01A9 0 9D32              S       LRTN                                       3BDDD760
01AA 0 4C3D D418         BSC  L  END,-Z      BR IF END OF PROGRAM           3B00D77D
                    *                                                       3B00078D
01AC 0 C02C         LPRTN LD     RID                                        3B0DD79D
01AD 0 4CDB D1A6         BSC  L  ADVNC,+     BR IF RID IS ZERO              3B00D8DD
01AF D B01F              A       RTTBL                                      3B000B1D
01B0 0 0012              STO     STRTN+1     SET RTN START ADDRS            3B000820
01B1 D CD27              LD      RID                                        3B0D0830
01B2 D B400 041D         A    L  NOTBL                                      3B0D084D
01B4 D DDD1              STO     *+1         ENTER RTN NUMBER IN MSG        3B000850
01B5 0 C400 D0D0         LD   L  *-*                                        3B00D86D
01B7 D D4D0 D498         STO  L  MSG06+2                                    3B000B70
                    *                                                       3B00088D
01B9 0 C4DD 04DF         LD   L  SWS                                        3B000890
01BB D 1DD9              SLA     9           RTN START MSG SELECTED         3B000900
01BC 0 4C1D D1C2         BSC  L  STRTN,-     *NO,BRANCH                     3BD00910
                    *                                                       3B000920
01BE 0 4400 043B         BSI  L  PRINT       PRINT RTN START MSG            3B000930
01CD D B47D              DC      MSGD1+/BDDD                                3B000940
01C1 0 0496              DC      MSG06                                      3B000950
                    *                                                       3B000960
01C2 0 4CBD D00D    STRTN BSC  I  *-*        START TEST ROUTINE             3B00097D
                    *                                                       3B0009B0
01C4 0 1803         SLRTN SRA    3                                          3B00D990
01C5 D 4C1B 01AC         BSC  L  LPRTN,+-    BR IF ND RTN SELECTED          3B00100D
                    *                                                       3B0D1010
01C7 0 9014              S       LRTN                                       3BD0102D
01C8 0 4C30 D1AC         BSC  L  LPRTN,Z-    BR IF INVALID RTN NO.          3B001030
                    *                                                       3BD01040
01CA D C4DD 040F         LD   L  SWS                                        3B0D1D5D
01CC 0 1808              SRA     8                                          3B00106D
01CD 0 D00B              STO     RID         SELECT ROUTINE                 3B00107D
01CE 0 70DD              MDX     LPRTN                                      3B00108D
                    *                                                       3B001090
                    *            RDUTINE ADDRESS TABLE                      3B001100
                    *                                                       3BDD1110
01CF 0 01CF         RTTBL DC     RTTBL                                      3BDD1120
01DD D D10D              DC      RTN1                                       3B00113D
01D1 0 D1F1              DC      RTN2                                       3BDD1140
01D2 0 D211              DC      RTN3                                       3B001150
01D3 D D24D              DC      RTN4                                       3B00116D
01D4 0 D265              DC      RTN5                                       3B001170
01D5 0 D278              DC      RTN6                                       3B0011B0
                    *                                                       3B001190
                    *            PROGRAM CONSTANTS                          3B00120D
                    *                                                       3B00121D
01D6 D 0D00         SIZE  DC     *-*         CORE SIZE                      3B00122D
01D7 D 1DDD         H1DDD DC     /1DDD                                      3B001230
0108 0 DDDA         H0D0A DC     /0D0A                                      3B00124D
01D9 D D0D0         RID   DC     *-*         RDUTINE NUMBER                 3BDD1250
01DA D FFFF         FFFF  DC     /FFFF                                      3B00126D
01DB D 5555         H5555 DC     /5555                                      3BD01270
01DC D 0006         LRTN  DC     6                                          3B00128D
                    *                                                       3B00129D
                    ************************************************        3B0013DD
                    *                                                       3B001310
                    *            TEST ROUTINE ONE                           3B00132D
                    *                                                       3B00133D
                    ************************************************        3B00134D
                    *                                                       3B00135D
01DD D C0FC         RTN1  LD     FFFF                                       3B0D1360
01DE 0 4400 0285         BSI  L  FILL        FILL CORE WITH FFFF            3B00137D
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                        *                                                       3B001380
01E0 0 4400 02DE    FUN11 BSI  L  UP          INCRE LOW TO HIGH CORE           3B001390
01E2 0 4400 0293          BSI  L  FLIP        CK AND STORE 0000                3B001400
                        *                                                       3B001410
01E4 0 4400 037B          BSI  L  LOKFN       CK FOR LOCK ON ERR FUNC          3B001420
01E6 0 70F9               MDX     FUN11                                        3B001430
                        *                                                       3B001440
01E7 0 7401 040E          MDX  L  FUNNO,1                                      3B001450
01E9 0 4400 02F1    FUN12 BSI  L  DOWN        DECRE HIGH TO LOW CORE           3B001460
01EB 0 4400 0293          BSI  L  FLIP        CK CORE AND STORE 0000           3B001470
                        *                                                       3B001480
01ED 0 4400 037B          BSI  L  LOKFN       CK FOR LOCK ON ERR FUNC          3B001490
01EF 0 70F9               MDX     FUN12                                        3B001500
                        *                                                       3B001510
01F0 0 70A5               MDX     CNTRL       GO TO CONTROL                    3B001520
                        *                                                       3B001530
                        ************************************************        3B001540
                        *                                                       3B001550
                        *           TEST ROUTINE TWO                            3B001560
                        *                                                       3B001570
                        ************************************************        3B001580
                        *                                                       3B001590
01F1 0 C400 02EF    RTN2  LD   L  LWRLM       FILL EACH CORE                   3B001600
01F3 0 D400 02E7          STO  L  ADDRS         LOCATION WITH                  3B001610
01F5 0 D480 02E7          STO  I  ADDRS           AOORESS                      3B001620
01F7 0 F400 02F0          EOR  L  UPRLM                                        3B001630
01F9 0 4C1B 0200          BSC  L  *+5,+-      BR LAST ADDRESS                  3B001640
                        *                                                       3B001650
01FB 0 C400 02E7          LD   L  ADDRS                                        3B001660
01FD 0 8400 02EB          A    L  H0001       INCRE AOORESS BY ONE             3B001670
01FF 0 70F3               MDX     RTN2+2                                       3B001680
                        *                                                       3B001690
0200 0 4400 020E    FUN21 BSI  L  UP          INCRE LOW TO HIGH CORE           3B001700
0202 0 4400 02AB          BSI  L  ADRCK       CK ANO COMPLEMENT                3B001710
                        *                                                       3B001720
0204 0 4400 037B          BSI  L  LOKFN       CK FOR LOCK ON ERR               3B001730
0206 0 70F9               MDX     FUN21                                        3B001740
                        *                                                       3B001750
0207 0 7401 040E          MDX  L  FUNNO,1                                      3B001760
0209 0 4400 02F1    FUN22 BSI  L  DOWN        DECRE HIGH TO LOW CORE           3B001770
020B 0 4400 02AB          BSI  L  ADRCK       CK ANO COMPLEMENT                3B001780
                        *                                                       3B001790
020D 0 4400 037B          BSI  L  LOKFN       LOCK ON FUNCTION                 3B001800
020F 0 70F9               MDX     FUN22                                        3B001810
                        *                                                       3B001820
0210 0 70B5               MDX     CNTRL                                        3B001830
                        *                                                       3B001840
                        ************************************************        3B001850
                        *                                                       3B001860
                        *           TEST ROUTINE THREE                          3B001870
                        *                                                       3B001880
                        ************************************************        3B001890
                        *                                                       3B001900
0211 0 C0C9         RTN3  LD         H5555                                      3B001910
0212 0 0400 02B2          STO  L  COMPL                                        3B001920
0214 0 4400 02DE          BSI  L  UP          INCRE LOW TO HIGH CORE           3B001930
                        *                                                       3B001940
0216 0 D400 02E7          STO  L  ADDRS                                        3B001950
0218 0 C400 02B2          LD   L  COMPL                                        3B001960
021A 0 D480 02E7          STO  I  ADDRS       STORE 5555 AAAA PATTERN          3B001970
021C 0 F0BD               EOR     FFFF        COMPLEMENT                       3B001980
021D 0 0400 02B2          STO  L  COMPL       SET UP NEXT WORD                 3B001990
021F 0 C400 02E7          LD   L  ADDRS                                        3B002000
0221 0 F400 02F0          EOR  L  UPRLM                                        3B002010
0223 0 4C1B 022A          BSC  L  *+5,+-      BR IF LAST ADDRS                 3B002020
                        *                                                       3B002030
0225 0 C400 02E7          LD   L  AOORS                                        3B002040
0227 0 B400 02EB          A    L  H0001       INCRE ADDRESS BY ONE             3B002050
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0229 0 70EC               MDX     RTN3+5                                       3B002060
                        *                                                       3B002070
022A 0 C0B0               LD      H5555                                        3B002080
022B 0 D400 02B2          STO  L  COMPL                                        3B002090
                        *                                                       3B002100
0220 0 C400 0282    FUN31 LD   L  COMPL                                        3B002110
022F 0 D400 02E6          STO  L  SLDBE                                        3B002120
0231 0 4400 02DE          BSI  L  UP          INCRE LOW TO HIGH CORE           3B002130
0233 0 4400 02C5          BSI  L  CHEX        CK AND COMPLEMENT                3B002140
                        *                                                       3B002150
0235 0 4400 037B          BSI  L  LOKFN       CK LOCK ON ERR                   3B002160
0237 0 70F5               MDX     FUN31                                        3B002170
                        *                                                       3B002180
023B 0 7401 040E          MDX  L  FUNNO,1                                      3B002190
023A 0 C400 02E6          LD   L  SLDBE                                        3B002200
023C 0 0400 02B2          STO  L  COMPL                                        3B002210
                        *                                                       3B002220
023E 0 C400 02B2    FUN32 LD   L  COMPL                                        3B002230
0240 0 D400 02B2          STO  L  COMPL                                        3B002240
0242 0 D400 02E6          STO  L  SLDBE                                        3B002250
0244 0 4400 02F1          BSI  L  DDWN        DECRE HIGH TO LDW CDRE           3B002260
0246 0 4400 02C5          BSI  L  CHEX        CK AND CDMPLEMENT                3B002270
                        *                                                       3B002280
024B 0 4400 037B          BSI  L  LOKFN       CK LOCK ON ERRDR                 3B002290
024A 0 70F3               MDX     FUN32                                        3B002300
                        *                                                       3B002310
024B 0 4C00 0196          BSC  L  CNTRL                                        3B002320
                        *                                                       3B002330
                        ************************************************        3B002340
                        *                                                       3B002350
                        *           TEST ROUTINE FOUR                           3B002360
                        *                                                       3B002370
                        ************************************************        3B002380
                        *                                                       3B002390
024D 0 C400 02EB    RTN4  LD   L  H0001                                        3B002400
024F 0 0030               STO     ALTNT                                        3B002410
0250 0 1010               SLA     16          CK EACH CORE LOCATION            3B002420
0251 0 4400 02F9          BSI  L  FLOAT         BIT BY BIT, ONE BIT ON         3B002430
                        *                                                       3B002440
0253 0 4400 037B          BSI  L  LOKFN       CK FOR LOCK ON ERR               3B002450
0255 0 70F7               MDX     RTN4                                         3B002460
                        *                                                       3B002470
0256 0 7401 040E          MDX  L  FUNNO,1                                      3B002480
                        *                                                       3B002490
025B 0 C02B         FUN42 LD      H0002                                        3B002500
0259 0 0026               STO     ALTNT                                        3B002510
025A 0 C400 010A          LD   L  FFFF                                         3B002520
025C 0 0400 02B2          STO  L  COMPL       CK EACH CORE LOCATION            3B002530
025E 0 4400 02F9          BSI  L  FLOAT         BIT BY BIT, ONE BIT OFF.       3B002540
                        *                                                       3B002550
0260 0 4400 0378          BSI  L  LOKFN       CK FOR LOCK ON ERR               3B002560
0262 0 70F5               MDX     FUN42                                        3B002570
                        *                                                       3B002580
0263 0 4C00 0196          BSC  L  CNTRL                                        3B002590
                        *                                                       3B002600
                        ************************************************        3B002610
                        *                                                       3B002620
                        *           TEST ROUTINE FIVE                           3B002630
                        *                                                       3B002640
                        ************************************************        3B002650
                        *                                                       3B002660
0265 0 1010         RTN5  SLA     16                                           3B002670
0266 0 D400 027F          STO  L  COUNT                                        3B002680
026B 0 4400 0315          BSI  L  WDRST       STORE WDRST CASE PATTERN         3B002690
                        *                                                       3B002700
026A 0 4400 0323    FUN61 BSI  L  CHECK       CK EACH CDRE LDCATION            3B002710
                        *                                                       3B002720
026C 0 4400 0378          BSI  L  LOKFN       CK LDCK ON ERROR                 3B002730
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026E 0 70FB                MDX     FUN61                                3B002740
                       *                                                3B002750
026F 0 7401 040E           MDX  L  FUNNO,1                              3B002760
0271 0 C011          FUN62 LD      H0004                                3B002770
0272 0 D400 027F           STO  L  COUNT                                3B002780
0274 0 4400 0335           BSI  L  SHAKE       CK AND COMPL 4 TIMES     3B002790
                       *                                                3B002800
0276 0 4400 037B           BSI  L  LOKFN       CK LOCK ON ERROR         3B002810
0278 0 70F8                MDX     FUN62                                3B002820
                       *                                                3B002830
0279 0 4C00 0196           BSC  L  CNTRL                                3B002840
                       *                                                3B002850
                       ************************************************ 3B002860
                       *                                                3B002870
                       *            TEST ROUTINE SIX                    3B002880
                       *                                                3B002890
                       ************************************************ 3B002900
                       *                                                3B002910
0278 0 C400 02E9       RTN6  LD   L  HFFFF       SET UP COMPLEMENT      3B002920
027A 0 0004                  STO     COMPL        WORST CASE PATTERN     3B002930
027C 0 70E6                  MDX     RTN5                                3B002940
                       *                                                3B002950
                       ************************************************ 3B002960
                       *                                                3B002970
                       *            SUBROUTINES FOR RTNS 1-6            3B002980
                       *                                                3B002990
                       ************************************************ 3B003000
                       *                                                3B003010
                       *            PROGRAM CONSTANTS                   3B003020
                       *                                                3B003030
027E 0 0000            COUNT DC      *-*                                3B003040
027F 0 0000            ALTNT DC      *-*                                3B003050
0280 0 0002            H0002 DC      /0002                              3B003060
0281 0 0000            COMPL DC      *-*                                3B003070
0282 0 0004            H0004 DC      /0004                              3B003080
0283 0 0000            PASS  OC      *-*                                3B003090
                       *                                                3B003100
                       *            FILL CORE WITH ONES                 3B003110
                       *                                                3B003120
0284 0 0000            FILL  OC      *-*                                3B003130
0285 0 005E                  STO     SLOBE                              3B003140
0286 0 C066                  LO      LWRLM       GET STARTING ADDRESS   3B003150
0287 0 D05D                  STO     ADDRS                              3B003160
0288 0 C05B                  LO      SLOBE       GET DATA WORD          3B003170
0289 0 0480 02E7             STO  I  ADDRS       STO DATA WORD          3B003180
028B 0 C059                  LO      AODRS                              3B003190
028C 0 F061                  EOR     UPRLM                              3B003200
028D 0 4C9B 0284             BSC  I  FILL,+-     BR IF LAST AODRESS     3B003210
                       *                                                3B003220
028F 0 C055                  LO      ADDRS                              3B003230
0290 0 8055                  A       H0001       INCRE AODRESS BY ONE   3B003240
0291 0 70F4                  MDX     FILL+3                             3B003250
                       *                                                3B003260
                       *            CK AND COMPLEMENT 0000/FFFF PATTERN 3B003270
                       *                                                3B003280
0292 0 0000            FLIP  OC      *-*                                3B003290
0293 0 0051                  STO     ADDRS       SAVE STARTING ADDRESS  3B003300
0294 0 C480 02E7             LD   I  ADDRS                              3B003310
0296 0 D051                  STO     WAS                                3B003320
0297 0 F040                  EOR     SLOBE       DATA WORD CORRECT      3B003330
0298 0 4420 0392             BSI  L  ERROR,Z     *NO, BRANCH TO ERROR RTN 3B003340
                       *                                                3B003350
029A 0 C0E5                  LD      COMPL                              3B003360
029B 0 0480 02E7             STO  I  AODRS       STORE NEW WORD         3B003370
029D 0 C047                  LD      ADDRS                              3B003380
029E 0 F04A                  EOR     ENOPT                              3B003390
029F 0 4C18 02A4             BSC  L  *+3,+-      BR IF LAST ADDRESS     3B003400
                       *                                                3B003410
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02A2 0 C044                LO      AODRS                              3B003420
02A3 0 804B                A       INCRE       INCRE AODRESS          3B003430
02A4 0 70EF                MDX     FLIP+1                             3B003440
                       *                                              3B003450
02A5 0 C040                LO      SLOBE                              3B003460
02A6 0 000B                STO     COMPL                              3B003470
02A7 0 F041                EOR     HFFFF                              3B003480
02A8 0 D030                STO     SLDBE                              3B003490
02A9 0 4CB0 0293           BSC  I  FLIP                               3B003500
                       *                                              3B003510
                       *           CK AND COMPLEMENT AODRESS PATTERN  3B003520
                       *                                              3B003530
02AB 0 0000            ADRCK DC      *-*                              3B003540
02AC 0 003A                STO     AODRS                              3B003550
02AD 0 F0D4                EOR     COMPL                              3B003560
02AE 0 D037                STO     SLOBE                              3B003570
02AF 0 C4B0 02E7           LD   I  AODRS                              3B003580
02B1 0 0038                STO     WAS                                3B003590
02B2 0 F033                EOR     SLDBE       DATA WORD CORRECT      3B003600
02B3 0 4420 0392           BSI  L  ERROR,Z     *NO, BRANCH            3B003610
                       *                                              3B003620
02B5 0 C030                LD      SLDBE                              3B003630
02B6 0 F032                EOR     HFFFF                              3B003640
02B7 0 0480 02E7           STO  I  AODRS       STORE COMPLEMENT       3B003650
02B9 0 C020                LD      ADORS                              3B003660
02BA 0 F030                EOR     ENOPT                              3B003670
02BB 0 4C1B 02C0           BSC  L  *+3,+-      BR IF LAST ADDRESS     3B003680
                       *                                              3B003690
02BD 0 C029                LO      ADDRS                              3B003700
02BE 0 8020                A       INCRE       INCRE AODRESS          3B003710
02BF 0 70EC                MDX     ADRCK+1                            3B003720
                       *                                              3B003730
02C0 0 C0C1                LO      COMPL                              3B003740
02C1 0 F027                EOR     HFFFF                              3B003750
02C2 0 D0BF                STO     COMPL                              3B003760
02C3 0 4CB0 02AB           BSC  I  ADRCK                              3B003770
                       *                                              3B003780
                       *           CK AND COMPLEMENT 5555/AAAA PATTERN 3B003790
                       *                                              3B003800
02C5 0 0000            CHEX  OC      *-*                              3B003810
02C6 0 0020                STO     AODRS                              3B003820
02C7 0 C480 02E7           LD   I  ADDRS                              3B003830
02C9 0 D020                STO     WAS                                3B003840
02CA 0 F01B                EOR     SLOBE       DATA WORD CORRECT      3B003850
02CB 0 4420 0392           BSI  L  ERROR,Z     *NO, BRANCH            3B003860
                       *                                              3B003870
02CD 0 C01B                LD      SLDBE                              3B003880
02CE 0 F01A                EOR     HFFFF                              3B003890
02CF 0 0480 02E7           STO  I  AODRS       STORE COMPLEMENT       3B003900
02D1 0 D014                STO     SLOBE                              3B003910
02D2 0 C014                LO      ADDRS                              3B003920
02D3 0 F017                EOR     ENOPT                              3B003930
02D4 0 4C18 02D9           BSC  L  *+3,+-      BR IF LAST AODRESS     3B003940
                       *                                              3B003950
02D6 0 C010                LO      AODRS                              3B003960
02D7 0 8014                A       INCRE       INCRE ADDRESS          3B003970
02DB 0 70ED                MDX     CHEX+1                             3B003980
                       *                                              3B003990
02D9 0 C0AB                LO      COMPL                              3B004000
02DA 0 F00E                EOR     HFFFF                              3B004010
02DB 0 00A6                STO     COMPL                              3B004020
02DC 0 4C80 02C5           BSC  I  CHEX                               3B004030
                       *                                              3B004040
                       *           INCREMENT FROM LOWER TO UPPER CORE 3B004050
                       *                                              3B004060
02DE 0 0000            UP    DC      *-*                              3B004070
02DF 0 C00B                LO      H0001                              3B004080
02E0 0 000B                STO     INCRE       SET UP AODRS INCREMENT 3B004090
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02E1 0 C00E              LD     UPRLM                                3B004100
02E2 0 0008              STO    ENDPT       SET LAST ADDRESS         3B004110
02E3 0 C00B              LD     LWRLM       SET FIRST ADDRESS        3B004120
02E4 0 4C80 02DE         BSC  1 UP                                   3B004130
                       *                                           3B004140
                       *            PROGRAM CONSTANTS              3B004150
                       *                                           3B004160
02E6 0 0000      SLDBE DC     *-*                                  3B004170
02E7 0 0000      ADDRS DC     *-*                                  3B004180
02E8 0 0001      H0001 DC     /0001                                3B004190
02E9 0 FFFF      HFFFF DC     /FFFF                                3B004200
02EA 0 0000      WAS   DC     *-*                                  3B004210
02EB 0 0000      ENDPT DC     *-*                                  3B004220
02EC 0 0000      INCRE DC     *-*                                  3B004230
02ED 0 0000      TEMP  DC     *-*                                  3B004240
02EE 0 8000      H8000 DC     /8000                                3B004250
02EF 0 0800      LWRLM DC     /0800                                3B004260
02F0 0 0000      UPRLM DC     *-*                                  3B004270
                       *                                           3B004280
                       *            DECREMENT FROM UPPER TO LOWER CORE 3B004290
                       *                                           3B004300
02F1 0 0000      DOWN  DC     *-*                                  3B004310
02F2 0 C0F6            LO     HFFFF       SET UP ADDRESS INCRE     3B004320
02F3 0 00F8            STO    INCRE                                3B004330
02F4 0 C0FA            LD     LWRLM                                3B004340
02F5 0 D0F5            STO    ENDPT       SET UP LAST ADDRESS      3B004350
02F6 0 C0F9            LO     UPRLM       SET UP FIRST ADDRESS     3B004360
02F7 0 4C80 02F1       BSC  I DOWN                                 3B004370
                       *                                           3B004380
                       *            CHECK BIT BY BIT PATTERN       3B004390
                       *                                           3B004400
02F9 0 0000      FLOAT OC     *-*                                  3B004410
02FA 0 C0F4            LD     LWRLM                                3B004420
02FB 0 00EB            STO    ADDRS       SAVE ADDRESS             3B004430
02FC 0 C0F1            LD     H8000                                3B004440
02FD 0 F084            EOR    COMPL                                3B004450
02FE 0 D0E7            STO    SLDBE                                3B004460
02FF 0 D480 02E7       STO  I ADDRS       STORE DATA WORD          3B004470
0301 0 C480 02E7       LD   I ADDRS                                3B004480
0303 0 D0E6            STO    WAS                                  3B004490
0304 0 F0E1            EOR    SLDBE       DATA CORRECT             3B004500
0305 0 4420 0392       BSI  L ERROR,Z     *NO, BRANCH              3B004510
                       *                                           3B004520
0307 0 C0DE            LO     SLDBE                                3B004530
0308 0 F400 0282        EOR  L COMPL      LAST SHIFT               3B004540
030A 0 4C04 030E       BSC  L *+2,E       *NO, BRANCH              3B004550
                       *                                           3B004560
030C 0 1801            SRA    1           SHIFT DATA               3B004570
0300 0 70EF            MDX    FLOAT+4                              3B004580
                       *                                           3B004590
030E 0 C0DB            LD     ADDRS                                3B004600
030F 0 F0E0            EOR    UPRLM                                3B004610
0310 0 4C98 02F9       BSC  I FLOAT,+-    BR IF LAST ADDRESS       3B004620
                       *                                           3B004630
0312 0 C0D4            LD     ADDRS                                3B004640
0313 0 80D4            A      H0001       INCRE ADDRESS            3B004650
0314 0 70E6            MDX    FLOAT+2                              3B004660
                       *                                           3B004670
                       *            STORE WORST CASE PATTERN       3B004680
                       *                                           3B004690
0315 0 0000      WORST DC     *-*                                  3B004700
0316 0 C0D8            LD     LWRLM                                3B004710
0317 0 D0CF            STO    ADDRS       SAVE ADDRESS             3B004720
0318 0 4400 0352       BSI  L FIND        FIND IF 0000 OR FFFF     3B004730
031A 0 D480 02E7       STO  I ADDRS       STORE DATA               3B004740
031C 0 C0CA            LO     ADDRS                                3B004750
031D 0 F002            EOR    UPRLM                                3B004760
031E 0 4C98 0315       BSC  I WORST,+-    BR IF LAST ADDRESS       3B004770
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                       *                                           3B004780
0320 0 C0C6              LD     ADDRS                                3B004790
0321 0 80C6              A      H0001       INCRE ADDRESS            3B004800
0322 0 70F4              MDX    WORST+2                              3B004810
                       *                                           3B004820
                       *            CHECK WORST CASE PATTERN       3B004830
                       *                                           3B004840
0323 0 0000      CHECK OC     *-*                                  3B004850
0324 0 C0CA            LO     LWRLM                                3B004860
0325 0 00C1            STO    ADDRS       SAVE ADDRESS             3B004870
0326 0 C480 02E7       LO   1 ADDRS                                3B004880
0328 0 00C1            STO    WAS                                  3B004890
0329 0 4C18 032E       BSC  L *+3,+-      BR IF DATA ZERO          3B004900
                       *                                           3B004910
032B 0 F0BD            EOR    HFFFF       COMPLEMENT DATA          3B004920
032C 0 4420 036D       BSI  L ERR,Z       BR TO ERROR RTN IF NOT 0 3B004930
                       *                                           3B004940
032E 0 C0B8            LD     ADDRS                                3B004950
032F 0 F0C0            EOR    UPRLM                                3B004960
0330 0 4C98 0323       BSC  I CHECK,+-    BR IF LAST ADDRESS       3B004970
                       *                                           3B004980
0332 0 C0B4            LD     ADDRS                                3B004990
0333 0 80B4            A      H0001       INCRE ADDRESS            3B005000
0334 0 70F0            MDX    CHECK+2                              3B005010
                       *                                           3B005020
                       *            CK AND COMPLEMENT 4 TIMES      3B005030
                       *                                           3B005040
0335 0 0000      SHAKE OC     *-*                                  3B005050
0336 0 C0B8            LD     LWRLM                                3B005060
0337 0 00AF            STO    ADDRS       SAVE ADDRESS             3B005070
033B 0 C4B0 02E7       LO   I ADDRS                                3B005080
033A 0 00AF            STO    WAS                                  3B005090
033B 0 4C18 0350       BSC  L INVRT,+-    BR DATA WORD ZERD        3B005100
                       *                                           3B005110
0330 0 F0AB            EOR    HFFFF       COMPL DATA               3B005120
033E 0 4420 0360       BSI  L ERR,Z       BR IF NOT ZERO           3B005130
                       *                                           3B005140
0340 0 04B0 02E7 STORE STO  1 ADDRS       STORE NEW DATA           3B005150
0342 0 74FF 027F       MDX  L COUNT,-1                             3B005160
0344 0 70F3            MDX    SHAKE+3                              3B005170
                       *                                           3B005180
0345 0 C0A1            LO     ADDRS                                3B005190
0346 0 F0A9            EOR    UPRLM                                3B005200
0347 0 4C98 0335       BSC  I SHAKE,+-    BR IF LAST ADDRESS       3B005210
                       *                                           3B005220
0349 0 C400 0283        LO   L H0004                               3B005230
034B 0 0400 027F        STO  L COUNT                               3B005240
034D 0 C099            LD     ADDRS                                3B005250
034E 0 8099            A      H0001       INCRE ADDRESS            3B005260
034F 0 70E7            MDX    SHAKE+2                              3B005270
                       *                                           3B005280
0350 0 F098      INVRT EOR    HFFFF       COMPLEMENT DATA          3B005290
0351 0 70EE            MDX    STORE                                3B005300
                       *                                           3B005310
                       *            DETERMINE IF DATA S/B 0000 OR FFFF 3B005320
                       *                                           3B005330
0352 0 0000      FIND  DC     *-*                                  3B005340
0353 0 C093            LD     ADDRS                                3B005350
0354 0 1806            SRA    6                                    3B005360
0355 0 D097            STO    TEMP                                 3B005370
0356 0 1802            SRA    2           ADDRS BITS 7 AND 9       3B005380
0357 0 F095            EOR    TEMP          BOTH 0 OR BOTH 1       3B005390
0358 0 4C04 035C       BSC  L *+2,E       *NO, BRANCH              3B005400
                       *                                           3B005410
035A 0 1010            SLA    16                                   3B005420
0358 0 7001            MDX    *+1                                  3B005430
                       *                                           3B005440
035C 0 C08C            LD     HFFFF       COMPLEMENT DATA FOR      3B005450
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035D 0 F400 0282          EOR  L  COMPL      COMPLEMENT WORST CASE        3B005460
035F 0 D086               STO     SLDBE                                   3B005470
0360 0 C400 027F          LO   L  COUNT      DATA COMPL ODD NO. TIMES     3B005480
0362 0 4C04 0367          BSC  L  *+3,E      *YES, BRANCH                 3B005490
                     *                                                    3B005500
0364 0 C081               LD      SLDBE                                   3B005510
0365 0 4C80 0352          BSC  I  FINO                                    3B005520
                     *                                                    3B005530
0367 0 C400 02E6          LD   L  SLOBE                                   3B005540
0369 0 F400 02E9          EOR  L  HFFFF      COMPLEMENT DATA              3B005550
036B 0 4C80 0352          BSC  I  FIND                                    3B005560
                     *                                                    3B005570
                     *            ERROR IN WORST CASE PATTERN            3B005580
                     *                                                    3B005590
036D 0 0000          ERR  DC      *-*                                    3B005600
036E 0 4400 0352          BSI  L  FIND       FIND GOOO OATA               3B005610
0370 0 D400 02E6          STO  L  SLDBE                                   3B005620
0372 0 4400 0392          BSI  L  ERROR      GO TO ERROR RTN              3B005630
0374 0 F400 02E9          EOR  L  HFFFF                                   3B005640
0376 0 4C80 036D          BSC  I  ERR                                     3B005650
                     *                                                    3B005660
                     *            CK PASS COUNT AND LOCK ON ERR          3B005670
                     *                                                    3B005680
0378 0 0000          LOKFN DC     *-*                                    3B005690
0379 0 7401 0284          MDX  L  PASS,1                                  3B005700
037B 0 C400 0284          LO   L  PASS                                    3B005710
037D 0 4C84 0378          BSC  I  LOKFN,E    BR IF COUNT ODD              3B005720
037F 0 1010               SLA     16                                      3B005730
0380 0 D400 0284          STO  L  PASS                                    3B005740
0382 0 7400 040D          MDX  L  ERRSW      ERROR SW ON                  3B005750
0384 0 7004               MDX     *+4        *YES BRANCH                  3B005760
                     *                                                    3B005770
0385 0 7401 0378          MDX  L  LOKFN,1    ADO ONE TO RETURN            3B005780
0387 0 4CB0 0378          BSC  I  LOKFN                                   3B005790
                     *                                                    3B005800
0389 0 086C               XIO     ROSWS      READ SWITCHES                3B005810
038A 0 C400 040F          LD   L  SWS                                     3B005820
038C 0 100C               SLA     12         LOCK ON ERR FUNC SELECTED    3B005830
038D 0 4CA8 0378          BSC  I  LOKFN,Z+   *YES, BRANCH                 3B005840
                     *                                                    3B005850
038F 0 1010               SLA     16                                      3B005860
0390 0 D07C               STO     ERRSW      CLEAR ERROR SW               3B005870
0391 0 70F3               MDX     LOKFN+13                                3B005880
                     *                                                    3B005890
                     ************************************************** 3B005900
                     *                                                    3B005910
                     *            ERROR ROUTINE                          3B005920
                     *                                                    3B005930
                     ************************************************** 3B005940
                     *                                                    3B005950
0392 0 0000          ERROR DC     *-*                                    3B005960
0393 0 CC00 0000          LDD  L  0                                       3B005970
0395 0 DC00 0404          STD  L  SAVE1                                   3B005980
0397 0 C85C               LDD     LINK                                    3B005990
0398 0 DC00 0000          STD  L  0          SET UP RESTART               3B006000
039A 0 085B               XIO     ROSWS      READ SWS                     3B006010
039B 0 C073               LD      SWS                                     3B006020
039C 0 E06E               AND     H00AE                                   3B006030
039D 0 F06E               EOR     H0006      ILLEGAL SWITCH COMBINATION   3B006040
039E 0 4C20 03A2          BSC  L  *+2,Z      *NO, BRANCH                  3B006050
                     *                                                    3B006060
03A0 0 3007               WAIT    7          ERR-ILLEGAL SWS              3B006070
03A1 0 70F5               MDX     ERROR+5                                 3B006080
                     *                                                    3B006090
03A2 0 C400 040E          LD   L  FUNNO                                   3B006100
03A4 0 8400 02E8          A    L  H0001                                   3B006110
03A6 0 8069               A       NOTBL                                   3B006120
03A7 0 D001               STO     *+1                                     3B006130
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03A8 0 C400 0000          LD   L  *-*                                     3B006140
03AA 0 D400 049E          STO  L  MSG07+3    PUT FUNC. NO. IN MSG         3B006150
03AC 0 4400 043B          BSI  L  PRINT      PRINT ERROR MSG              3B006160
03AE 0 8492               DC      MSG05+/8000                             3B006170
03AF 0 8496               DC      MSG06+/8000                             3B006180
03B0 0 049B               DC      MSG07                                   3B006190
                     *                                                    3B006200
03B1 0 C050               LD      SWS                                     3B006210
03B2 0 100E               SLA     14                                      3B006220
03B3 0 4C28 03C6          BSC  L  NWAIT,Z+   BY IF BYPASS WAIT            3B006230
                     *                                                    3B006240
03B5 0 C400 02E6          LO   L  SLDBE      GET GOOD DATA                3B006250
03B7 0 1890               SRT     16         PUT IN Q                     3B006260
03B8 0 C400 02EA          LD   L  WAS        BAD DATA IN A                3B006270
03BA 0 3004               WAIT    4          ERROR WAIT                   3B006280
                     *                                                    3B006290
03BB 0 C400 040E          LD   L  FUNNO                                   3B006300
03BD 0 8400 02E8          A    L  H0001                                   3B006310
03BF 0 1B88               SRT     8          PUT FUNCTION NO.             3B006320
03C0 0 C400 01D9          LO   L  RID         AND RTN NO.                 3B006330
03C2 0 1888               SRT     8           IN Q REG                    3B006340
03C3 0 C400 02E7          LD   L  ADDRS      ADDRS IN ACC                 3B006350
03C5 0 3005               WAIT    5          ERROR WAIT                   3B006360
                     *                                                    3B006370
03C6 0 082F          NWAIT XIO    ROSWS      READ SWS                     3B006380
03C7 0 C047               LO      SWS                                     3B006390
03C8 0 0044               STO     ERRSW      SET ERROR SWITCH             3B006400
03C9 0 100B               SLA     8                                       3B006410
03CA 0 4C2B 03D6          BSC  L  LOOPA,Z+   BR TO LOOP ADDRESS           3B006420
                     *                                                    3B006430
03CC 0 CC00 0404          LDD  L  SAVE1                                   3B006440
03CE 0 DC00 0000          STO  L  0                                       3B006450
03D0 0 C400 02E6          LD   L  SLDBE                                   3B006460
03D2 0 D480 02E7          STO  I  ADDRS                                   3B006470
03D4 0 4C80 0392          BSC  I  ERROR                                   3B006480
03D6 0 C400 0280     LODPA LO   L  ALTNT                                  3B006490
                     *                                                    3B006500
03D8 0 8031               A       H7000      FIND LAST GOOD OATA          3B006510
03D9 0 0001               STO     *+1         WORD STORED                 3B006520
03DA 0 C400 02E6          LD   L  SLDBE                                   3B006530
03DC 0 7000               MOX     *                                       3B006540
                     *                                                    3B006550
03DD 0 7011               MDX     ALT00                                   3B006560
03DE 0 7013               MDX     ALT01                                   3B006570
                     *                                                    3B006580
03DF 0 1001          ALT02 SLA    1                                       3B006590
03E0 0 8400 02E8          A    L  H0001                                   3B006600
03E2 0 D480 02E7          STO  I  ADDRS      STO LAST GOOD DATA           3B006610
03E4 0 C400 02E6          LD   L  SLDBE                                   3B006620
03E6 0 D480 02E7          STO  I  ADDRS      STO LAST BAD DATA            3B006630
03E8 0 C480 02E7          LO   I  ADDRS                                   3B006640
03EA 0 F400 02E6          EOR  L  SLDBE      DATA GOOD NOW                3B006650
03EC 0 4C20 0393          BSC  L  ERROR+1,Z  *NO,BRANCH                   3B006660
                     *                                                    3B006670
03EE 0 70D7               MDX     NWAIT                                   3B006680
                     *                                                    3B006690
03EF 0 F400 02E9     ALT00 EOR  L  HFFFF                                  3B006700
03F1 0 70F0               MDX     ALT02+3                                 3B006710
                     *                                                    3B006720
03F2 0 1001          ALT01 SLA    1                                       3B006730
03F3 0 70EE               MDX     ALT02+3                                 3B006740
                     *                                                    3B006750
                     *            CONSTANTS   IOCC TABLE                  3B006760
                     *                                                    3B006770
03F4    0000              BSS  E                                          3B006780
03F4 0 4C00 0161     LINK BSC  L  CRSIZ                                   3B006790
03F6 0 040F          RDSWS DC     SWS                                     3B006800
03F7 0 3A00               DC      /3A00                                   3B006810
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03F8 0 0475          VECTR DC      INT                                3B006B20
03F9 0 0479                DC      STOP                               3B006830
03FA 0 0000          SENSE DC      0                                  3B006840
03FB 0 0F01                DC      /0F01                              3B006850
03FC 0 0408          RETRN DC      CR                                 3B006860
03FD 0 0900                DC      /0900                              3B006870
03FE 0 0402          PRNT1 DC      CHAR1                              3B006B80
03FF 0 0900                DC      /0900                              3B006890
0400 0 0403          PRNT2 DC      CHAR2                              3B006900
0401 0 0900                DC      /0900                              3B006910
0402 0 0000          CHAR1 DC      *-*                                3B006920
0403 0 0000          CHAR2 DC      *-*                                3B006930
0404 0 0000          SAVE1 DC      *-*                                3B006940
0405 0 0000                DC      *-*                                3B006950
0406 0 0000          SAVE2 DC      *-*                                3B006960
0407 0 0000                DC      0                                  3B006970
0408 0 8500          CR    DC      /8500                              3B006980
0409 0 0000          MSGAD DC      *-*                                3B006990
040A 0 7000          H7000 DC      /7000                              3B007000
040B 0 00AE          H00AE DC      /00AE                              3B007010
040C 0 0006          H0006 DC      /0006                              3B007020
040D 0 0000          ERRSW DC      0                                  3B007030
040E 0 0000          FUNNO DC      *-*                                3B007040
040F 0 0000          SWS   DC      *-*                                3B007050
0410 0 0410          NDTBL DC      NDTBL                              3B007060
0411 0 C4FC                DC      /C4FC     01                       3B007070
0412 0 C4D8                DC      /C4D8     02                       3B007080
0413 0 C4DC                DC      /C4DC     03                       3B007090
0414 0 C4F0                DC      /C4F0     04                       3B007100
0415 0 C4F4                DC      /C4F4     05                       3B007110
0416 0 C4D0                DC      /C4D0     06                       3B007120
0417 0 C4D4                DC      /C4D4     07                       3B007130
                     *                                                3B007140
                     ************************************************ 3B007150
                     *                                                3B007160
                     *          PRDGRAM END RDUTINE                   3B007170
                     *                                                3B007180
                     ************************************************ 3B007190
                     *                                                3B007200
0418 0 4400 0438      END   BSI  L  PRINT     PRINT END MSG           3B007210
041A 0 8481                 DC     MSG02+/8000                        3B007220
041B 0 0484                 DC     MSG03                              3B007230
041C 0 C8D7                 LDD    LINK                               3B007240
041D 0 DC00 0000            STD  L 0                                  3B007250
041F 0 08D6                 XID    RDSWS     READ SWS                 3B007260
0420 0 C0EE                 LD     SWS                                3B007270
0421 0 100B                 SLA    11        LOOP PROGRAM             3B007280
0422 0 4C28 018E            BSC  L START,Z+  *YES, BRANCH             3B007290
                     *                                                3B007300
0424 0 3002                 WAIT   2         END PRDGRAM              3B007310
                     *                                                3B007320
0425 0 08D0                 XIO    RDSWS     READ SWS                 3B007330
0426 0 C0E8                 LO     SWS                                3B007340
0427 0 4C04 0161            BSC  L CRSIZ,E   BR IF SW 15 DN           3B007350
                     *                                                3B007360
                     *          LOADER LINKAGE                        3B007370
                     *                                                3B007380
0429 0 C00F                 LD     SVINT                              3B007390
042A 0 D400 0008            STO  L /8                                 3B007400
042C 0 C00D                 LD     SVINT+1                            3B007410
042D 0 D400 000C            STD  L /C                                 3B007420
042F 0 6300                 LDX    3 0                                3B007430
                     *                                                3B007440
0430 0 6078                 LDX    /0078     LOAD NEXT PROG.          3B007450
                     *                                                3B007460
0431 0 C400 0008      LDLNK LD   L /8                                 3B007470
0433 0 D005                 STO    SVINT                              3B007480
0434 0 C400 000C            LD   L /C                                 3B007490
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0436 0 D003                 STO    SVINT+1                            3B007500
0437 0 4C00 0161            BSC  L CRSIZ                              3B007510
                     *                                                3B007520
0439 0 0000          SVINT DC      *-*                                3B007530
043A 0 0000                DC      *-*                                3B007540
                     *                                                3B007550
                     ************************************************ 3B007560
                     *                                                3B007570
                     *          PRINT ROUTINE                         3B007580
                     *                                                3B007590
                     ************************************************ 3B007600
                     *                                                3B007610
043B 0 0000          PRINT DC      *-*                                3B007620
043C 0 08B9                XIO    RDSWS     READ SWS                 3B007630
043D 0 C0D1                LD     SWS                                3B007640
043E 0 100D                SLA    13        BYPASS PRINT DN          3B007650
043F 0 4C10 0448           BSC  L PRNIT,-   *NO, BRANCH              3B007660
                     *                                                3B007670
0441 0 7401 043B     GTDUT MDX  L  PRINT,1                            3B007680
0443 0 C480 043B           LD   I PRINT                              3B007690
0445 0 4C10 046D           BSC  L OUT,-                              3B007700
                     *                                                3B007710
0447 0 70F9                MDX    GTOUT                              3B007720
                     *                                                3B007730
0448 0 CC00 000C     PRNIT LDD  L  12                                 3B007740
044A 0 DC00 0406           STD  L SAVE2                              3B007750
044C 0 C8AB                LDD    VECTR                              3B007760
044D 0 DC00 000C           STD  L 12        SET INT VECTDR           3B007770
044F 0 08AC                XIO    RETRN     CARRIER RETURN           3B007780
0450 0 3006                WAIT   6                                  3B007790
                     *                                                3B007800
0451 0 C480 043B     GTADR LD   I  PRINT     GET MSG ADDRS            3B007810
0453 0 D0B5                STD    MSGAD                              3B007820
0454 0 C480 0409           LD   I MSGAD     GET CHAR TO PRINT        3B007830
0456 0 F400 02E9           EOR  L HFFFF                              3B007840
0458 0 4C18 0466           BSC  L MSGEN,+-  BR IF TERMINATOR         3B007850
                     *                                                3B007860
045A 0 F400 02E9           EDR  L HFFFF                              3B007870
045C 0 D0A5                STO    CHAR1     STO FIRST CHAR           3B007880
045D 0 1008                SLA    8                                  3B007890
045E 0 D0A4                STO    CHAR2     STO SECDND CHAR          3B007900
045F 0 089E                XIO    PRNT1     PRINT FIRST CHAR         3B007910
0460 0 3006                WAIT   6                                  3B007920
                     *                                                3B007930
0461 0 0B9E                XID    PRNT2     PRINT SECOND CHAR        3B007940
0462 0 3006                WAIT   6                                  3B007950
                     *                                                3B007960
0463 0 7401 0409           MOX  L MSGAD,1   INCRE MSG TABLE ADDRS     3B007970
0465 0 70EE                MDX    GTAOR+3                            3B007980
                     *                                                3B007990
0466 0 C480 043B     MSGEN LD   I  PRINT                              3B008000
046B 0 4C10 046D           BSC  L OUT,-     BR IF LAST MSG SECTION   3B008010
                     *                                                3B008020
046A 0 7401 043B           MDX  L PRINT,1                            3B008030
046C 0 70E4                MDX    GTADR                              3B008040
                     *                                                3B008050
046D 0 7401 043B     OUT   MDX  L  PRINT,1                            3B008060
046F 0 CC00 0406           LDD  L SAVE2                              3B008070
0471 0 DC00 000C           STD  L 12                                 3B008080
0473 0 4C80 043B           BSC  I PRINT                              3B008090
0475 0 0000          INT   DC      *-*                                3B008100
0476 0 0883                XIO    SENSE     SENSE DSW AND RESET      3B008110
0477 0 4CC0 0475           BOSC I INT                                3B008120
                     *                                                3B008130
0479 0 0000          STDP  DC      *-*                                3B008140
047A 0 3008                WAIT   8         PROG STOP WAIT           3B008150
047B 0 4CC0 0479           BOSC I STOP                               3B008160
                     *                                                3B008170
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047D 0 9A9E        MSG01 DC    /9A9E     ST          38008180
047E 0 3E62              DC    /3E62     AR          38008190
047F 0 9E21              DC    /9E21     T           38008200
0480 0 FFFF              DC    /FFFF                 38008210
                   *                                 38008220
0481 0 3676        MSG02 DC    /3676     EN          38008230
0482 0 3221              DC    /3221     D           38008240
0483 0 FFFF              DC    /FFFF                 38008250
                   *                                 38008260
0484 0 2622        MSG03 DC    /2622     HI          38008270
0485 0 1626              DC    /1626     GH          38008280
0486 0 211E              DC    /211E      C          38008290
0487 0 5262              DC    /5262     OR          38008300
0488 0 3621              DC    /3621     E           38008310
0489 0 9E36              DC    /9E36     TE          38008320
048A 0 9A9E              DC    /9A9E     ST          38008330
048B 0 FFFF              DC    /FFFF                 38008340
                   *                                 38008350
048C 0 1E52        MSG04 DC    /1E52     CO          38008360
048D 0 6236              DC    /6236     RE          38008370
048E 0 219A              DC    /219A      S          38008380
048F 0 22A2              DC    /22A2     IZ          38008390
0490 0 3621              DC    /3621     E           38008400
0491 0 FFFF              DC    /FFFF                 38008410
                   *                                 38008420
0492 0 0936        MSG05 DC    /0936     SR E        38008430
0493 0 6262              DC    /6262     RR          38008440
0494 0 2121              DC    /2121                 38008450
0495 0 FFFF              DC    /FFFF                 38008460
                   *                                 38008470
0496 0 629E        MSG06 DC    /629E     RT          38008480
0497 0 7621              DC    /7621     N           38008490
0498 0 0000              DC    *-*       XX          38008500
0499 0 2121              DC    /2121                 38008510
049A 0 FFFF              DC    /FFFF                 38008520
                   *                                 38008530
049B 0 2112        MSG07 DC    /2112      F          38008540
049C 0 B276              DC    /B276     UN          38008550
049D 0 1E21              DC    /1E21     C           38008560
049E 0 0000              DC    *-*       YY          38008570
049F 0 FFFF              DC    /FFFF                 38008580
04A0   0431              END   LDLNK                 38008590
 NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY
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C R O S S R E F E R E N C E

NAME	VALUE	REFERENCES
ADDRS	02E7	01F3,01F5,01FB,0216,021A,021F,0225,0288,028A,028C,0290,0294,0295 029C,029E,02A2,02AC,02AF,02B7,02B9,0280,02C6,02C7,02CF,02D2,02D6 02FB,02FF,0301,030E,0312,0317,031A,031C,0320,0325,0326,032E,0332 0337,0338,0340,0345,034D,0353,03C3,03D2,03E2,03E6,03E8
ADRCK	02AB	0202,020B,028F,02C3
ADVNC	01A6	01AD
ALTNT	0280	0197,024F,0259,03D6
ALT00	03EF	03DD
ALT01	03F2	03DE
ALT02	03DF	03F1,03F3
CHAR1	0402	03FE,045C
CHAR2	0403	0400,045E
CHECK	0323	026A,0330,0334
CHEX	02C5	0233,0246,02D8,02DC
CNTRL	0196	01F0,0210,024B,0263,0279
COMPL	0282	0198,0212,0218,021D,022B,022D,023C,023E,0240,025C,027D,0298,02A6 02AD,02C0,02C2,02D9,02DB,02F0,0308,035D
COUNT	027F	0266,0272,0342,0348,0360
CR	0408	03FC
CRSIZ	0161	0171,0184,03F4,0427,0437
DOWN	02F1	01E9,0209,0244,02F7
END	0418	01AA
ENDPT	02E8	029F,02BA,02D3,02E2,02F5
ERR	036D	032C,033E,0376
ERROR	0392	0299,02B3,02C8,0305,0372,03A1,03D4,03EC
ERRSW	040D	0194,03B2,0390,03C8
FFFF	01DA	01DD,021C,025A
FILL	0285	01DE,028E,0292
FIND	0352	0318,0365,0368,036E
FLIP	0293	01E2,01EB,02A4,02A9
FLOAT	02F9	0251,025E,030D,0310,0314
FNDSZ	0185	016C,0179
FUNNO	040E	019D,01E7,0207,0238,0256,026F,03A2,0388
FUN11	01E0	01E6
FUN12	01E9	01EF
FUN21	0200	0206
FUN22	0209	020F
FUN31	022D	0237
FUN32	023E	024A
FUN42	0258	0262
FUN61	026A	026E
FUN62	0271	0278
GTADR	0451	0465,046C
GTOUT	0441	0447
HFFFF	02E9	0278,02A7,02B6,02C1,02CE,02DA,02F2,0328,033D,0350,035C,0369,0374 03EF,0456,045A
H00AE	040B	039C
H000A	01D8	0189
H0001	02E8	0186,01FD,0227,024D,0291,02DF,0313,0321,0333,034E,03A4,038D,03E0
H0002	0281	0258
H0004	0283	0271,0349
H0006	040C	039D
H1000	01D7	0161
H5555	01D8	0211,022A
H7000	040A	03D8
H8000	02EE	02FC
INCRE	02EC	02A3,02BE,02D7,02E0,02F3
INT	0475	03F8,0477
INVRT	0350	033B
LDLNK	0431	04A0
LINK	03F4	0166,0173,0178,0397,041C
LOKFN	0378	01E4,01ED,0204,020D,0235,0248,0253,0260,026C,0276,037D,0385,0387 038D,0391
LOOPA	03D6	03CA
LPRTN	01AC	01C5,01C8,01CE
LRTN	01DC	01A9,01C7

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LWRLM   02EF   01F1,0287,02E3,02F4,02FA,0316,0324,0336
MSGAD   0409   0453,0454,0463
MSGEN   0466   0458
MSG01   047D   0190,01C0
MSG02   0481   041A
MSG03   0484   0191,D41B
MSG04   048C   0182
MSG05   0492   0181,03AE
MSG06   0496   0187,01C1,03AF
MSG07   0498   03AA,D3B0
NOT8L   0410   01B2,03A6,0410
NWAIT   03C6   0383,03EE
OUT     046D   0445,046B
PASS    0284   0199,0379,0378,0380
PRINT   0438   017F,018E,01BE,03AC,0418,0441,0443,0451,0466,046A,046D,0473
PRNIT   0448   043F
PRNT1   03FE   045F
PRNT2   0400   0461
RDSWS   03F6   019F,0389,039A,03C6,041F,0425,043C
RETRN   03FC   044F
RID     0109   0193,01A6,01A8,01AC,0181,01CD,03C0
RTN1    0100   01D0
RTN2    01F1   01D1,01FF
RTN3    0211   01D2,0229
RTN4    024D   01D3,0255
RTN5    0265   01D4,027E
RTN6    0278   01D5
RTT8L   01CF   01AF,01CF
SAVE1   0404   0395,03CC
SAVE2   0406   044A,046F
SENSE   03FA   0476
SHAKE   0335   0274,0344,0347,034F
SIZE    01D6   0162,0168,016E,0170,0175,0185,0188,018C
SLOBE   02E6   022F,023A,0242,0286,0289,0298,02A5,02A8,02AE,02B2,0285,02CA,02CD
               0201,02FE,0304,0307,035F,0364,0367,0370,0385,03D0,03DA,03E4,03EA
SLRTN   01C4   01A4
START   018E   0422
STOP    0479   03F9,047B
STORE   0340   0351
STRTN   01C2   0180,018C
SVINT   0439   0429,042C,0433,0436
SWS     040F   01A1,0189,01CA,038A,0398,03B1,03C7,03F6,0420,0426,043D
TEMP    02ED   0355,0357
UP      020E   01E0,0200,0214,0231,02E4
UPRLM   02F0   018A,01F7,0221,028D,02E1,02F6,030F,031D,032F,0346
VECTR   03F8   044C
WAS     02EA   0297,0281,02C9,0303,0328,033A,03B8
WORST   0315   0268,031E,0322

END OF ASSEMBLY
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---------- LAST PAGE ----------

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                        ABS                                                 3B100020
0000                    ORG     /0960                                       3B100030
0960 0 03B1             DC      /03B1       PIO                             3B100040
                    *                                                       3B100050
                    ***************************************************     3B100060
                    *                                                       3B100070
                    *           PROGRAM INITIALIZATION                      3B100080
                    *                                                       3B100090
                    ***************************************************     3B100100
                    *                                                       3B100110
                    *           FIND CORE SIZE                              3B100120
                    *                                                       3B100130
0961 0 C071         CRSIZ LO    H1000                                       3B100140
0962 D D06F               STO   SIZE        SET 8K CORE SIZE                3B100150
0963 0 1010               SLA   16                                          3B100160
0964 0 D400 0000          STO L 0           CLEAR ADDRS 0000                3B100170
0966 0 CC00 08F0          LOD L LINK                                        3B100180
0968 0 DC80 09D2          STD I SIZE        STO RESTART LINKAGE             3B100190
096A 0 C400 0000          LD  L 0           DID WRAP-AROUND OCCUR           3B100200
096C 0 4C20 0985          BSC L FNDSZ,Z     *YES, BRANCH                    3B100210
                    *                                                       3B100220
096E 0 C063               LO    SIZE                                        3B100230
096F 0 1001               SLA   1           INCRE SIZE BY 4K                3B100240
0970 0 D061               STO   SIZE        IS SIZE OVER 32K                3B100250
0971 0 4C10 0963          BSC L CRSIZ+2,-   *NO, BRANCH                    3B100260
                    *                                                       3B100270
0973 0 CC00 08F0          LDD L LINK                                        3B100280
0975 0 DC80 09D2          STD I SIZE        STO RESTART LINKAGE             3B100290
0977 0 C400 0000          LD  L 0           DID WRAP-AROUND OCCUR           3B100300
0979 0 4C20 0985          BSC L FNDSZ,Z     *YES, BRANCH                    3B100310
                    *                                                       3B100320
097D 0 DC00 000D          STO L 0                                           3B100330
097F 0 4400 0C23          BSI L PRINT       PRINT ERROR MSG                 3B100340
0981 0 BC7A               DC    MSG05+/8000                                 3B100350
0982 0 0C74               DC    MSG04                                       3B100360
                    *                                                       3B100370
0983 0 3003               WAIT  3           ERR, CANNOT FIND CORE SIZE      3B100380
0984 0 70DC               MDX   CRSIZ       RETRY                           3B100390
                    *                                                       3B100400
0985 0 C04C         FNDSZ LD    SIZE                                        3B100410
0986 0 9400 0AE4          S   L HOD01       CORRECT CORE SIZE               3B100420
098B 0 D049               STO   SIZE                                        3B100430
0989 0 3001               WAIT  1           WAIT FOR SWS, SIZE IN ACC       3B100440
                    *                                                       3B100450
098A 0 4400 0C23    START BSI L PRINT       PRINT START MSG                 3B100460
098C 0 8C65               DC    MSG01+/8000                                 3B100470
098D 0 0C6C               DC    MSG03                                       3B100480
                    *                                                       3B100490
098E 0 1010               SLA   16                                          3B100500
098F D D045               STO   RIO                                         3B100510
0990 0 D400 0C09          STO L ERRSW                                       3B100520
                    *                                                       3B100530
                    ***************************************************     3B100540
                    *                                                       3B100550
                    *           ROUTINE SEQUENCE CONTROL                    3B100560
                    *                                                       3B100570
                    ***************************************************     3B100580
                    *                                                       3B100590
0992 0 1010         CNTRL SLA   16                                          3B100600
0993 0 D400 0A7C          STO L ALTNT                                       3B100610
0995 0 D400 0A80          STO L PASS                                        3B100620
0997 0 D400 0A7E          STO L COMPL                                       3B100630
0999 0 D400 0C0A          STO L FUNND                                       3B100640
099B 0 0C00 0BF2          XIO L RDSWS       READ SWS                        3B100650
099D 0 C400 0C08          LD  L SWS                                         3B100660
099F 0 1805               SRA   5                                           3B100670
09A0 0 4C04 09C0          BSC L SLRTN,E     BR IF LOOP RTN SELECTED         3B100680
                                                                            3B100690
```



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                    *                                                       3B100700
09A2 0 7401 09D5    ADVNC MDX   L RID,1       ADVANCE TO NEXT RTN         3B100710
09A4 0 C030               LD    RIO                                       3B100720
09A5 0 9032               S     LRTN                                      3B100730
09A6 0 4C30 0C14          BSC   L END,-Z      BR IF END OF PROGRAM        3B100740
                    *                                                       3B100750
09A8 0 C02C         LPRTN LO    RID                                       3B100760
09A9 0 4C08 09A2          BSC   L ADVNC,+     BR IF RID IS ZERO           3B100770
09AB 0 801F               A     RTTBL                                     3B100780
09AC 0 0012               STO   STRTN+1       SET RTN START ADDRS         3B100790
09AD 0 C027               LD    RID                                       3B100800
09AE 0 8400 0C0C          A   L NOTBL                                     3B100810
09B0 0 0001               STO   *+1           ENTER RTN NUMBER IN MSG     3B100820
09B1 0 C400 0000          LD  L *-*                                       3B100830
09B3 0 0400 0C80          STO L MSG06+2                                   3B100840
                    *                                                       3B100850
09B5 0 C400 0C0B          LD  L SWS                                       3B100860
09B7 0 1009               SLA   9             RTN START MSG SELECTED      3B100870
09B8 0 4C10 09BE          BSC L STRTN,-       *NO,BRANCH                  3B100880
                    *                                                       3B100890
09BA 0 4400 0C23          BSI L PRINT         PRINT RTN START MSG         3B100900
09BC 0 BC65               DC    MSG01+/8000                               3B100910
09BD 0 0C7E               DC    MSG06                                     3B100920
                    *                                                       3B100930
09BE 0 4C80 0000    STRTN BSC I *-*           START TEST ROUTINE          3B100940
                    *                                                       3B100950
09C0 0 1B03         SLRTN SRA   3                                         3B100960
09C1 0 4C18 09AB          BSC L LPRTN,+-      BR IF NO RTN SELECTED       3B100970
                    *                                                       3B100980
09C3 0 9014               S     LRTN                                      3B100990
09C4 0 4C30 09AB          BSC L LPRTN,Z-      BR IF INVALID RTN NO.       3B101000
                    *                                                       3B101010
09C6 0 C400 0C0B          LD  L SWS                                       3B101020
09C8 0 1B08               SRA   8                                         3B101030
09C9 0 000B               STO   RID           SELECT ROUTINE              3B101040
09CA 0 70D0               MDX   LPRTN                                     3B101050
                    *                                                       3B101060
                    *           ROUTINE ADDRESS TABLE                       3B101070
                    *                                                       3B101080
09CB 0 09CB         RTTBL DC    RTTBL                                     3B101090
09CC 0 0909               DC    RTN1                                      3B101100
09CD 0 09E0               DC    RTN2                                      3B101110
09CE 0 0A00               DC    RTN3                                      3B101120
09CF 0 0A49               DC    RTN4                                      3B101130
09D0 0 0A61               DC    RTN5                                      3B101140
0901 0 0A77               DC    RTN6                                      3B101150
                    *                                                       3B101160
                    *           PROGRAM CONSTANTS                           3B101170
                    *                                                       3B101180
09D2 0 0000         SIZE  DC    *-*         CORE SIZE                     3B101190
09D3 0 1000         H1000 DC    /1000                                     3B101200
09D4 0 000A         H000A DC    /000A                                     3B101210
09D5 0 0000         RID   DC    *-*         ROUTINE NUMBER                3B101220
09D6 0 FFFF         FFFF  DC    /FFFF                                     3B101230
09D7 0 5555         H5555 DC    /5555                                     3B101240
09D8 0 0006         LRTN  DC    6                                         3B101250
                    *                                                       3B101260
                    ***************************************************     3B101270
                    *                                                       3B101280
                    *           TEST ROUTINE ONE                            3B101290
                    *                                                       3B101300
                    ***************************************************     3B101310
                    *                                                       3B101320
09D9 0 C0FC         RTN1  LD    FFFF                                      3B101330
09DA 0 4400 0A8I          BSI L FILL          FILL CORE WITH FFFF         3B101340
                    *                                                       3B101350
09DC 0 4400 0ADA    FUN11 BSI L UP            INCRE LOW TO HIGH CORE      3B101360
09DE 0 4400 0A8F          BSI L FLIP          CK AND STORE 0000           3B101370
```

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                        *                                                       3B101380
09E0 0 4400 0B74                BSI  L  LOKFN       CK FOR LOCK ON ERR FUNC     3B101390
09E2 0 70F9                     MDX     FUN11                                   3B101400
                        *                                                       3B101410
09E3 0 7401 0C0A                MDX  L  FUNNO,1                                 3B101420
09E5 0 4400 0AED        FUN12   BSI  L  DOWN        DECRE HIGH TO LOW CORE      3B101430
09E7 0 440D 0A8F                BSI  L  FLIP        CK CORE AND STORE 0000      3B101440
                        *                                                       3B101450
09E9 0 4400 0B74                BSI  L  LOKFN       CK FOR LOCK ON ERR FUNC     3B101460
09EB 0 70F9                     MDX     FUN12                                   3B101470
                        *                                                       3B101480
09EC 0 70A5                     MDX     CNTRL       GO TO CONTROL               3B101490
                        *                                                       3B101500
                        ********************************************************3B101510
                        *                                                       3B101520
                        *             TEST ROUTINE TWO                          3B101530
                        *                                                       3B101540
                        ********************************************************3B101550
                        *                                                       3B101560
09ED 0 C400 0AEB        RTN2    LD   L  LWRLM       FILL EACH CORE              3B101570
09EF 0 D400 0AE3                STO  L  ADDRS         LOCATION WITH             3B101580
09F1 0 D480 0AE3                STO  I  ADDRS           ADDRESS                 3B101590
09F3 0 F400 0AEC                EOR  L  UPRLM                                   3B101600
09F5 0 4C18 09FC                BSC  L  *+5,+-      BR LAST AODRESS             3B101610
                        *                                                       3B101620
09F7 D C400 0AE3                LO   L  AODRS                                   3B101630
09F9 0 8400 0AE4                A    L  H0001       INCRE AODRESS BY ONE        3B101640
09FB 0 70F3                     MOX     RTN2+2                                  3B101650
                        *                                                       3B101660
09FC 0 4400 0ADA        FUN21   BSI  L  UP          INCRE LOW TO HIGH CORE      3B101670
09FE 0 4400 0AA7                BSI  L  ADRCK       CK AND COMPLEMENT           3B101680
                        *                                                       3B101690
0A00 0 4400 0B74                BSI  L  LOKFN       CK FOR LOCK ON ERR          3B101700
0A02 0 70F9                     MDX     FUN21                                   3B101710
                        *                                                       3B101720
0A03 0 7401 0C0A                MDX  L  FUNNO,1                                 3B101730
0A05 0 4400 0AE0        FUN22   BSI  L  DOWN        DECRE HIGH TO LOW CORE      3B101740
0A07 0 4400 0AA7                BSI  L  ADRCK       CK AND COMPLEMENT           3B101750
                        *                                                       3B101760
0A09 0 4400 0B74                BSI  L  LOKFN       LOCK ON FUNCTION            3B101770
0A0B 0 70F9                     MOX     FUN22                                   3B101780
                        *                                                       3B101790
0A0C 0 70B5                     MOX     CNTRL                                   3B101800
                        *                                                       3B101810
                        ********************************************************3B101820
                        *                                                       3B101830
                        *             TEST ROUTINE THREE                        3B101840
                        *                                                       3B101850
                        ********************************************************3B101860
                        *                                                       3B101870
0A0D 0 C0C9             RTN3    LO      H5555                                   3B101880
0A0E 0 D400 0A7E                STO  :  COMPL                                   3B101890
0A10 0 4400 0ADA                BSI  L  UP          INCRE LOW TO HIGH CORE      3B101900
                        *                                                       3B101910
0A12 0 0400 0AE3                STO  L  AODRS                                   3B101920
0A14 0 C400 0A7E                LO   L  COMPL                                   3B101930
0A16 0 D480 0AE3                STO  I  AODRS       STORE 5555 AAAA PATTERN     3B101940
0A18 0 F0BD                     EOR     FFFF        COMPLEMENT                  3B101950
0A19 0 0400 0A7E                STO  L  COMPL       SET UP NEXT WORD            3B101960
0A1B 0 C400 0AE3                LD   L  ADDRS                                   3B101970
0A1D 0 F400 0AEC                EOR  L  UPRLM                                   3B101980
0A1F 0 4C1B 0A26                BSC  L  *+5,+-      BR IF LAST ADDRS            3B101990
                        *                                                       3B102000
0A21 0 C400 0AE3                LO   L  ADDRS                                   3B102010
0A23 0 8400 0AE4                A    L  H0001       INCRE AODRESS BY ONE        3B102020
0A25 0 70EC                     MOX     RTN3+5                                  3B102030
                        *                                                       3B102040
0A26 0 C0B0                     LO      H5555                                   3B102050
```



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0A27 0 D400 0A7E                STO  L  COMPL                                   3B102060
                        *                                                       3B102070
0A29 0 C400 0A7E        FUN31   LD   L  COMPL                                   3B102080
0A2B 0 D400 0AE2                STO  L  SLOBE                                   3B102090
0A2D 0 4400 0ADA                BSI  L  UP          INCRE LOW TO HIGH CORE      3B102100
0A2F 0 4400 0AC1                BSI  L  CHEX        CK AND COMPLEMENT           3B102110
                        *                                                       3B102120
0A31 0 4400 0B74                BSI  L  LOKFN       CK LOCK ON ERR              3B102130
0A33 0 70F5                     MDX     FUN31                                   3B102140
                        *                                                       3B102150
0A34 0 7401 0C0A                MDX  L  FUNNO,1                                 3B102160
0A36 0 C400 0AE2                LD   L  SLDBE                                   3B102170
0A38 0 D400 0A7E                STO  L  COMPL                                   3B102180
                        *                                                       3B102190
0A3A 0 C400 0A7E        FUN32   LD   L  COMPL                                   3B102200
0A3C 0 D400 0A7E                STO  L  COMPL                                   3B102210
0A3E 0 D400 0AE2                STO  L  SLOBE                                   3B102220
0A40 0 4400 0AED                BSI  L  DOWN        DECRE HIGH TO LOW CORE      3B102230
0A42 0 4400 0AC1                BSI  L  CHEX        CK AND COMPLEMENT           3B102240
                        *                                                       3B102250
0A44 0 4400 0B74                BSI  L  LOKFN       CK LOCK ON ERROR            3B102260
0A46 0 70F3                     MDX     FUN32                                   3B102270
                        *                                                       3B102280
0A47 0 4C00 0992                BSC  L  CNTRL                                   3B102290
                        *                                                       3B102300
                        ********************************************************3B102310
                        *                                                       3B102320
                        *             TEST ROUTINE FOUR                         3B102330
                        *                                                       3B102340
                        ********************************************************3B102350
                        *                                                       3B102360
0A49 0 C400 0AE4        RTN4    LD   L  H0001                                   3B102370
0A4B 0 0030                     STO     ALTNT                                   3B102380
0A4C 0 1010                     SLA     16          CK EACH CORE LOCATION       3B102390
0A4D 0 4400 0AF5                BSI  L  FLOAT         BIT BY BIT, ONE BIT ON    3B102400
                        *                                                       3B102410
0A4F 0 4400 0B74                BSI  L  LOKFN       CK FOR LOCK ON ERR          3B102420
0A51 0 70F7                     MDX     RTN4                                    3B102430
                        *                                                       3B102440
0A52 0 7401 0C0A                MDX  L  FUNNO,1                                 3B102450
                        *                                                       3B102460
0A54 0 C02B             FUN42   LD      H0002                                   3B102470
0A55 0 0026                     STO     ALTNT                                   3B102480
0A56 0 C400 09D6                LO   L  FFFF                                    3B102490
0A58 0 D400 0A7E                STO  L  COMPL       CK EACH CORE LOCATION       3B102500
0A5A 0 4400 0AF5                BSI  L  FLOAT         BIT BY BIT, ONE BIT OFF.  3B102510
                        *                                                       3B102520
0A5C 0 4400 0B74                BSI  L  LOKFN       CK FOR LOCK ON ERR          3B102530
0A5E 0 70F5                     MDX     FUN42                                   3B102540
                        *                                                       3B102550
0A5F 0 4C00 0992                BSC  L  CNTRL                                   3B102560
                        *                                                       3B102570
                        ********************************************************3B102580
                        *                                                       3B102590
                        *             TEST ROUTINE FIVE                         3B102600
                        *                                                       3B102610
                        ********************************************************3B102620
                        *                                                       3B102630
0A61 0 1010             RTN5    SLA     16                                      3B102640
0A62 0 D400 0A7B                STO  L  COUNT                                   3B102650
0A64 0 4400 0B11                BSI  L  WORST       STORE WORST CASE PATTERN    3B102660
                        *                                                       3B102670
0A66 0 4400 DB1F        FUN61   BSI  L  CHECK       CK EACH CORE LOCATION       3B102680
                        *                                                       3B102690
0A68 0 4400 0B74                BSI  L  LOKFN       CK LOCK ON ERROR            3B102700
0A6A 0 70FB                     MDX     FUN61                                   3B102710
                        *                                                       3B102720
0A6B 0 7401 0C0A                MOX  L  FUNNO,1                                 3B102730
```

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0A60 0 C011        FUN62 LO      H0004                              3B102740
0A6E 0 0400 0A7B         STO   L  COUNT                             3B102750
0A70 0 4400 0831         BSI   L  SHAKE      CK AND COMPL 4 TIMES   3B102760
                         *                                         3B102770
0A72 0 4400 0874         BSI   L  LOKFN      CK LOCK ON ERROR       3B102780
0A74 0 70F8              MDX      FUN62                             38102790
                         *                                         3B102800
0A75 0 4C00 0992         BSC   L  CNTRL                             38102810
                         *                                         3B102820
                         ********************************************* 3B102830
                         *                                         38102840
                         *            TEST ROUTINE S1X             3B102850
                         *                                         3B102860
                         ********************************************* 38102870
                         *                                         3B102880
0A77 0 C400 0AE5   RTN6  LO    L  HFFFF     SET UP COMPLEMENT      38102890
0A79 0 0004              STO      COMPL      WORST CASE PATTERN     38102900
0A7A 0 70E6              MDX      RTN5                              38102910
                         *                                         3B102920
                         ********************************************* 3B102930
                         *                                         38102940
                         *            SUBROUTINES FOR RTNS 1-6     38102950
                         *                                         38102960
                         ********************************************* 3B102970
                         *                                         3B102980
                         *            PROGRAM CONSTANTS            3B102990
                         *                                         3B103000
0A7B 0 0000        COUNT OC      *-*                                38103010
0A7C 0 0000        ALTNT DC      *-*                                38103020
0A7D 0 0002        H0002 DC      /0002                              38103030
0A7E 0 0000        COMPL OC      *-*                                3B103040
0A7F 0 0004        H0004 OC      /0004                              38103050
0A80 0 0000        PASS  DC      *-*                                38103060
                         *                                         38103070
                         *            FILL CORE WITH ONES          3B103080
                         *                                         3B103090
0A81 0 0000        FILL  DC      *-*                                3B103100
0A82 0 D05F              STO      SL08E                             3B103110
0A83 0 C067              LO       LWRLM      GET STARTING AOORESS   3B103120
0A84 0 005E              STO      AOORS                             38103130
0A85 0 C05C              LO       SLOBE      GET OATA WORO          38103140
0A86 0 D480 0AE3         STO   I  AOORS      STO DATA WORO          3B103150
0A88 0 C05A              LD       AOORS                             3B103160
0A89 0 F062              EOR      UPRLM                             38103170
0A8A 0 4C98 0AB1         BSC   I  FILL,+-    8R IF LAST AOORESS     38103180
                         *                                         3B103190
0A8C 0 C056              LO       AOORS                             38103200
0A8D 0 8056              A        H0001      INCRE ADDRESS BY ONE   38103210
0A8E 0 70F5              MDX      FILL+3                            38103220
                         *                                         38103230
                         *            CK AND COMPLEMENT 0000/FFFF PATTERN 3B103240
                         *                                         3B103250
0A8F 0 0000        FLIP  OC      *-*                                3B103260
0A90 0 D052              STO      AOORS      SAVE STARTING ADDRESS  3B103270
0A91 0 C480 0AE3         LD    I  AOORS                             38103280
0A93 0 0052              STO      WAS                               38103290
0A94 0 F04D              EOR      SLDBE      DATA WORD CORRECT      3B103300
0A95 0 4420 0BBE         8SI   L  ERROR,Z    *NO, 8RANCH TO ERROR RTN 38103310
                         *                                         3B103320
0A97 0 C0E6              LO       COMPL                             3B103330
0A98 0 D480 0AE3         STO   I  AOORS      STORE NEW WORD         3B103340
0A9A 0 C04B              LO       AOORS                             3B103350
0A9B 0 F048              EOR      ENDPT                             38103360
0A9C 0 4C18 0AA1         BSC   L  *+3,+-     BR IF LAST ADDRESS     3B103370
                         *                                         3B103380
0A9E 0 C044              LD       AOORS                             3B103390
0A9F 0 8048              A        INCRE      INCRE ADDRESS          3B103400
0AA0 0 70EF              MDX      FLIP+1                            3B103410
```



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                         *                                         3B103420
0AA1 0 C040              LD       SLOBE                             3B103430
0AA2 0 000B              STO      COMPL                             3B10344D
0AA3 0 F041              EOR      HFFFF                             3B103450
0AA4 0 0030              STO      SLOBE                             3B103460
0AA5 0 4CB0 0A8F         8SC   I  FLIP                             3B103470
                         *                                         3B103480
                         *            CK AND COMPLEMENT ADDRESS PATTERN 3B103490
                         *                                         3B103500
0AA7 0 0000        AORCK OC      *-*                                3B103510
0AAB 0 003A              STO      AOORS                             3B103520
0AA9 0 F004              EOR      COMPL                             3B103530
0AAA 0 0037              STO      SLOBE                             3B103540
0AA8 0 C480 0AE3         LD    I  AOORS                             3B103550
0AAD 0 0038              STO      WAS                               3B103560
0AAE 0 F033              EOR      SLDBE      OATA WORD CORRECT      3B103570
0AAF 0 4420 0B8E         BSI   L  ERROR,Z    *NO, BRANCH            3B103580
                         *                                         3B103590
0AB1 0 C030              LO       SLO8E                             3B103600
0AB2 0 F032              EOR      HFFFF                             3B103610
0AB3 0 0480 0AE3         STO   I  AOORS      STORE COMPLEMENT       3B103620
0AB5 0 C020              LO       AOORS                             3B103630
0AB6 0 F030              EOR      ENOPT                             3B103640
0AB7 0 4C18 0A8C         8SC   L  *+3,+-     8R IF LAST AOORESS     3B103650
                         *                                         3B103660
0AB9 0 C029              LO       AOORS                             3B103670
0ABA 0 8020              A        INCRE      INCRE ADDRESS          3B103680
0A8B 0 70EC              MDX      AORCK+1                           3B103690
                         *                                         3B103700
0A8C 0 C0C1              LO       COMPL                             3B103710
0ABO 0 F027              EOR      HFFFF                             3B103720
0ABE 0 008F              STO      COMPL                             3B103730
0ABF 0 4CB0 0AA7         8SC   I  AORCK                            3B103740
                         *                                         3B103750
                         *            CK AND COMPLEMENT 5555/AAAA PATTERN 3B103760
                         *                                         3B103770
0AC1 0 0000        CHEX  DC      *-*                                3B103780
0AC2 0 0020              STO      AOORS                             3B103790
0AC3 0 C480 0AE3         LO    I  AOORS                             3B103800
0AC5 0 0020              STO      WAS                               3B103810
0AC6 0 F01B              EOR      SLO8E      OATA WORD CORRECT      3B103820
0AC7 0 4420 088E         8SI   L  ERROR,Z    *NO, BRANCH            3B103830
                         *                                         3B103840
0AC9 0 C018              LO       SLD8E                             3B103850
0ACA 0 F01A              EOR      HFFFF                             3B103860
0ACB 0 D480 0AE3         STO   I  AOORS      STORE COMPLEMENT       3B103870
0ACO 0 D014              STO      SLD8E                             3B103880
0ACE 0 C014              LD       ADDRS                             3B103890
0ACF 0 F017              EOR      ENDPT                             3B103900
0AD0 0 4C18 0AD5         BSC   L  *+3,+-     BR IF LAST ADDRESS     3B103910
                         *                                         3B103920
0AD2 0 C010              LD       AOORS                             3B103930
0AD3 0 B014              A        INCRE      INCRE ADDRESS          3B103940
0AD4 0 70E0              MDX      CHEX+1                            3B103950
                         *                                         3B103960
0AD5 0 C0A8              LD       COMPL                             3B103970
0AD6 0 F00E              EOR      HFFFF                             3B103980
0AD7 0 0DA6              STO      COMPL                             3B103990
0AD8 0 4C80 0AC1         BSC   I  CHEX                              3B104000
                         *                                         3B104010
                         *            INCREMENT FROM LOWER TO UPPER CORE 3B104020
                         *                                         38104030
0ADA 0 0000        UP    DC      *-*                                3B104040
0ADB 0 C008              LD       H0001                             3B104050
0ADC 0 000B              STO      INCRE      SET UP ADORS INCREMENT 3B104060
0ADD 0 C00E              LD       UPRLM                             3B104070
0ADE D D008              STO      ENDPT      SET LAST ADDRESS       3B104080
0ADF 0 C00B              LD       LWRLM      SET FIRST ADDRESS      3B104090
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0AE0 0 4CB0 0ADA          BSC  I  UP                                  3B104100
                    *                                                 3B104110
                    *              PROGRAM CONSTANTS                    3B104120
                    *                                                 3B104130
0AE2 0 0000         SLOBE DC      *-*                                 3B104140
0AE3 0 0000         ADDRS DC      *-*                                 3B104150
0AE4 0 0001         H0001 DC      /0001                               3B104160
0AE5 0 FFFF         HFFFF DC      /FFFF                               3B104170
0AE6 0 0000         WAS   DC      *-*                                 3B104180
0AE7 0 0000         ENDPT DC      *-*                                 3B104190
0AE8 0 0000         INCRE DC      *-*                                 3B104200
0AE9 0 0000         TEMP  DC      *-*                                 3B104210
0AEA 0 B000         H80DD DC      /B000                               3B104220
0AEB 0 FFF6         LWRLM DC      /FFF6                               3B104230
0AEC 0 0900         UPRLM DC      /0900                               3B104240
                    *                                                 3B104250
                    *              DECREMENT FROM UPPER TO LOWER CORE   3B104260
                    *                                                 3B104270
0AED 0 0000         DOWN  DC      *-*                                 3B104280
0AEE 0 C0F6               LD      HFFFF       SET UP ADDRESS INCRE    3B104290
0AEF 0 00FB               STO     INCRE                               3B104300
0AF0 0 C0FA               LD      LWRLM                               3B104310
0AF1 0 00F5               STO     ENDPT       SET UP LAST ADDRESS     3B104320
0AF2 0 C0F9               LD      UPRLM       SET UP FIRST ADDRESS    3B104330
0AF3 0 4C80 0AE0          BSC  I  DOWN                                3B104340
                    *                                                 3B104350
                    *              CHECK BIT BY BIT PATTERN             3B104360
                    *                                                 3B104370
0AF5 0 0000         FLOAT DC      *-*                                 3B104380
0AF6 0 C0F4               LD      LWRLM                               3B104390
0AF7 0 00EB               STO     ADDRS       SAVE ADDRESS            3B104400
0AF8 0 C0F1               LO      H8000                               3B104410
0AF9 0 F0B4               EOR     COMPL                               3B104420
0AFA 0 D0E7               STO     SLDBE                               3B104430
0AFB 0 D4B0 0AE3          STO  I  ADDRS       STORE DATA WORD         3B104440
0AFD 0 C4B0 0AE3          LO   I  ADDRS                               3B104450
0AFF 0 00E6               STO     WAS                                 3B104460
0B00 0 F0E1               EOR     SLDBE       DATA CORRECT            3B104470
0B01 0 4420 0B8E          BSI  L  ERROR,Z     *NO, BRANCH             3B104480
                    *                                                 3B104490
0B03 0 C0DE               LO      SLOBE                               3B104500
0B04 0 F400 0A7E          EOR  L  COMPL       LAST SHIFT              3B104510
0B06 0 4C04 0B0A          BSC  L  *+2,E       *NO, BRANCH             3B104520
                    *                                                 3B104530
0B08 0 1B01               SRA     1           SHIFT DATA              3B104540
0B09 0 70EF               MDX     FLOAT+4                             3B104550
                    *                                                 3B104560
0B0A 0 C0DB               LO      ADDRS                               3B104570
0B0B 0 F0E0               EOR     UPRLM                               3B104580
0B0C 0 4C9B 0AF5          BSC  I  FLOAT,+-    BR IF LAST ADDRESS      3B104590
                    *                                                 3B104600
0B0E 0 C0D4               LD      ADDRS                               3B104610
0B0F 0 B0D4               A       H0001       INCRE ADDRESS           3B104620
0B10 0 70E6               MDX     FLOAT+2                             3B104630
                    *                                                 3B104640
                    *              STORE WORST CASE PATTERN             3B104650
                    *                                                 3B104660
0B11 0 0000         WORST OC      *-*                                 3B104670
0B12 0 C0DB               LO      LWRLM                               3B104680
0B13 0 00CF               STO     ADDRS       SAVE ADDRESS            3B104690
0B14 0 4400 0B4E          BSI  L  FIND        FIND IF 0000 OR FFFF    3B104700
0B16 0 D4B0 0AE3          STO  I  ADDRS       STORE DATA              3B104710
0B18 0 C0CA               LD      ADDRS                               3B104720
0B19 0 F0D2               EOR     UPRLM                               3B104730
0B1A 0 4C9B 0B11          BSC  I  WORST,+-    BR IF LAST ADDRESS      3B104740
                    *                                                 3B104750
0B1C 0 C0C6               LD      ADDRS                               3B104760
0B1D 0 B0C6               A       H0001       INCRE ADDRESS           3B104770
```



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0B1E 0 70F4               MDX     WORST+2                             3B104780
                    *                                                 3B104790
                    *              CHECK WORST CASE PATTERN             3B104B0D
                    *                                                 3B104B10
0B1F 0 0000         CHECK OC      *-*                                 3B104B20
0B20 0 C0CA               LD      LWRLM                               3B104B30
0B21 0 D0C1               STO     ADDRS       SAVE ADDRESS            3B104B40
0B22 0 C4B0 0AE3          LO   I  ADDRS                               3B104B50
0B24 0 D0C1               STO     WAS                                 3B104860
0B25 0 4C1B 0B2A          BSC  L  *+3,+-      BR IF DATA ZERO         3B104870
                    *                                                 3B104BB0
0B27 0 F0B0               EOR     HFFFF       COMPLEMENT DATA         3B104B90
0B28 0 4420 0B69          BSI  L  ERR,Z       BR TO ERROR RTN IF NOT 0 3B104900
                    *                                                 3B104910
0B2A 0 C0BB               LO      ADDRS                               3B104920
0B2B 0 F0C0               EOR     UPRLM                               3B104930
0B2C 0 4C9B 0B1F          BSC  I  CHECK,+-    BR IF LAST ADDRESS      3B104940
                    *                                                 3B104950
0B2E 0 C0B4               LO      ADDRS                               3B104960
0B2F 0 B0B4               A       H0001       INCRE ADDRESS           3B104970
0B30 0 70F0               MDX     CHECK+2                             3B104980
                    *                                                 3B104990
                    *              CK AND COMPLEMENT 4 TIMES            3B105000
                    *                                                 3B105010
0B31 0 D000         SHAKE DC      *-*                                 3B105020
0B32 0 C0BB               LO      LWRLM                               3B105030
0B33 0 00AF               STO     ADDRS       SAVE ADDRESS            3B105040
0B34 0 C480 0AE3          LO   I  ADDRS                               3B105050
0B36 0 D0AF               STO     WAS                                 3B105060
0B37 0 4C1B 0B4C          BSC  L  INVRT,+-    BR DATA WORD ZERO       3B105070
                    *                                                 3B105080
0B39 0 F0AB               EOR     HFFFF       COMPL DATA              3B105090
0B3A 0 4420 0B69          BSI  L  ERR,Z       BR IF NOT ZERO          3B105100
                    *                                                 3B105110
0B3C 0 0480 0AE3    STORE STO  I  ADDRS       STORE NEW DATA          3B105120
0B3E 0 74FF 0A7B          MDX  L  COUNT,-1                            3B105130
0B40 0 70F3               MDX     SHAKE+3                             3B105140
                    *                                                 3B105150
0B41 0 C0A1               LO      ADDRS                               3B105160
0B42 0 F0A9               EOR     UPRLM                               3B105170
0B43 0 4C9B 0B31          BSC  I  SHAKE,+-    BR IF LAST ADDRESS      3B105180
                    *                                                 3B105190
0B45 0 C400 0A7F          LO   L  H0004                               3B105200
0B47 0 D400 0A7B          STO  L  COUNT                               3B105210
0B49 0 C099               LO      ADDRS                               3B105220
0B4A 0 8099               A       H0001       INCRE ADDRESS           3B105230
0B4B 0 70E7               MDX     SHAKE+2                             3B105240
                    *                                                 3B105250
0B4C 0 F09B         INVRT EOR     HFFFF       COMPLEMENT DATA         3B105260
0B4E 0 70EE               MDX     STORE                               3B105270
                    *                                                 3B105280
                    *              DETERMINE IF DATA S/B 0000 OR FFFF   3B105290
                    *                                                 3B105300
0B4E 0 0000         FIND  DC      *-*                                 3B105310
0B4F 0 C093               LD      ADDRS                               3B105320
0B50 0 1B06               SRA     6                                   3B105330
0B51 0 0097               STO     TEMP                                3B105340
0B52 0 1B02               SRA     2           ADDRS BITS 7 AND 9      3B105350
0B53 0 F095               EOR     TEMP          BOTH 0 OR BOTH 1      3B105360
0B54 0 4C04 0B5B          BSC  L  *+2,E       *NO, BRANCH             3B105370
                    *                                                 3B105380
0B56 0 1010               SLA     16                                  3B105390
0B57 0 7001               MDX     *+1                                 3B105400
                    *                                                 3B105410
0B58 0 C0BC               LD      HFFFF       COMPLEMENT DATA FOR     3B105420
0B59 0 F400 0A7E          EOR  L  COMPL         COMPLEMENT WORST CASE 3B105430
0B5B 0 DD86               STO     SLDBE                               3B105440
0B5C 0 C400 0A7B          LO   L  COUNT       DATA COMPL ODD NO. TIMES 3B105450
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0B5E 0 4C04 0B63          BSC  L  *+3,E      *YES, BRANCH                3B105460
                       *                                                 3B105470
0B60 0 C081               LD      SLDBE                                  3B105480
0B61 0 4CB0 0B4E          BSC  I  FIND                                   3B105490
                       *                                                 3B105500
0B63 0 C400 0AE2          LD   L  SLOBE                                  3B105510
0B65 0 F400 0AE5          EOR  L  HFFFF       COMPLEMENT DATA            3B105520
0B67 0 4CB0 0B4E          BSC  I  FIND                                   3B105530
                       *                                                 3B105540
                       *          ERROR IN WORST CASE PATTERN            3B105550
                       *                                                 3B105560
0B69 0 0000            ERR   OC    *-*                                    3B105570
0B6A 0 4400 0B4E          BSI  L  FIND        FIND GOOD DATA             3B105580
0B6C 0 D400 0AE2          STO  L  SLDBE                                  3B105590
0B6E 0 4400 0B8E          BSI  L  ERROR       GO TO ERROR RTN            3B105600
0B70 0 F400 0AE5          EOR  L  HFFFF                                  3B105610
0B72 0 4CB0 0B69          BSC  I  ERR                                    3B105620
                       *                                                 3B105630
                       *          CK PASS COUNT AND LOCK ON ERR          3B105640
                       *                                                 3B105650
0B74 0 0000            LOKFN DC    *-*                                    3B105660
0B75 0 7401 0AB0          MDX  L  PASS,1                                 3B105670
0B77 0 C400 0AB0          LD   L  PASS                                   3B105680
0B79 0 4CB4 0B74          BSC  I  LOKFN,E     BR IF COUNT 000            3B105690
0B7B 0 1010               SLA     16                                     3B105700
0B7C 0 0400 0AB0          STO  L  PASS                                   3B105710
0B7E 0 7400 0C09          MDX  L  ERRSW       ERROR SW ON                3B105720
0B80 0 7004               MDX     *+4         *YES BRANCH                3B105730
                       *                                                 3B105740
0B81 0 7401 0B74          MDX  L  LOKFN,1     ADD ONE TO RETURN          3B105750
0B83 0 4CB0 0B74          BSC  I  LOKFN                                  3B105760
                       *                                                 3B105770
0B85 0 0B6C               XIO     RDSWS       READ SWITCHES              3B105780
0B86 0 C400 0C0B          LD   L  SWS                                    3B105790
0B88 0 100C               SLA     12          LOCK ON ERR FUNC SELECTED  3B105800
0B89 0 4CAB 0B74          BSC  L  LOKFN,Z+    *YES, BRANCH               3B105810
                       *                                                 3B105820
0B8B 0 1010               SLA     16                                     3B105830
0B8C 0 D07C               STO     ERRSW       CLEAR ERROR SW             3B105840
0B8D 0 70F3               MDX     LOKFN+13                               3B105850
                       *                                                 3B105860
                       ************************************************* 3B105870
                       *                                                 3B105880
                       *          ERROR ROUTINE                          3B105890
                       *                                                 3B105900
                       ************************************************* 3B105910
                       *                                                 3B105920
0B8E 0 0000            ERROR DC    *-*                                    3B105930
0B8F 0 CC00 0000          LOD  L  0                                      3B105940
0B91 0 0C00 0C00          STD  L  SAVE1                                  3B105950
0B93 0 CB5C               LDD     LINK                                   3B105960
0B94 0 0C00 0000          STD  L  0           SET UP RESTART             3B105970
0B96 0 0B5B               XIO     RDSWS       READ SWS                   3B105980
0B97 0 C073               LO      SWS                                    3B105990
0B98 0 E06E               AND     H00AE                                  3B106000
0B99 0 F06E               EOR     H0006       ILLEGAL SWITCH COMBINATION 3B106010
0B9A 0 4C20 0B9E          BSC  L  *+2,Z       *NO, BRANCH                3B106020
                       *                                                 3B106030
0B9C 0 3007               WAIT    7           ERR-ILLEGAL SWS            3B106040
0B9D 0 70F5               MDX     ERROR+5                                3B106050
                       *                                                 3B106060
0B9E 0 C400 0C0A          LD   L  FUNNO                                  3B106070
0BA0 0 B400 0AE4          A    L  H0001                                  3B106080
0BA2 0 B069               A       NOTBL                                  3B106090
0BA3 0 0001               STO     *+1                                    3B106100
0BA4 0 C400 0000          LD   L  *-*                                    3B106110
0BA6 0 D400 0CB6          STO  L  MSG07+3     PUT FUNC. NO. IN MSG       3B106120
0BA8 0 4400 0C23          BSI  L  PRINT       PRINT ERROR MSG            3B106130
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0BAA 0 BC7A               OC      MSG05+/8000                            3B106140
0BAB 0 8C7E               DC      MSG06+/8000                            3B106150
0BAC 0 0CB3               OC      MSG07                                  3B106160
                       *                                                 3B106170
0BAD 0 C05D               LD      SWS                                    3B106180
0BAE 0 100E               SLA     14                                     3B106190
0BAF 0 4C28 0BC2          BSC  L  NWAIT,Z+    BY IF BYPASS WAIT          3B106200
                       *                                                 3B106210
0BB1 0 C400 0AE2          LD   L  SLDBE       GET GOOD DATA              3B106220
0BB3 0 1B90               SRT     16          PUT IN Q                   3B106230
0BB4 0 C400 0AE6          LO   L  WAS         BAD DATA IN A              3B106240
0BB6 0 3004               WAIT    4           ERROR WAIT                 3B106250
                       *                                                 3B106260
0BB7 0 C400 0C0A          LO   L  FUNNO                                  3B106270
0BB9 0 B400 0AE4          A    L  H0001                                  3B106280
0BBB 0 1BBB               SRT     B           PUT FUNCTION NO.           3B106290
0BBC 0 C400 09D5          LO   L  RIO          AND RTN NO.               3B106300
0BBE 0 1BBB               SRT     B            IN Q REG                  3B106310
0BBF 0 C400 0AE3          LO   L  ADDRS       ADDRS IN ACC               3B106320
0BC1 0 3005               WAIT    5           ERROR WAIT                 3B106330
                       *                                                 3B106340
0BC2 0 0B2F            NWAIT XIO     RDSWS     READ SWS                   3B106350
0BC3 0 C047               LD      SWS                                    3B106360
0BC4 0 0044               STO     ERRSW       SET ERROR SWITCH           3B106370
0BC5 0 1008               SLA     B                                      3B106380
0BC6 0 4C28 0BD2          BSC  L  LOOPA,Z+    BR TO LOOP ADDRESS         3B106390
                       *                                                 3B106400
0BCB 0 CC00 0C00          LDD  L  SAVE1                                  3B106410
0BCA 0 DC00 0000          STD  L  0                                      3B106420
0BCC 0 C400 0AE2          LO   L  SLDBE                                  3B106430
0BCE 0 D480 0AE3          STO  1  ADDRS                                  3B106440
0BD0 0 4C80 0B8E          BSC  I  ERROR                                  3B106450
0BD2 0 C400 0A7C       LOOPA LD   L  ALTNT                               3B106460
                       *                                                 3B106470
0BD4 0 8031               A       H7000       FIND LAST GOOD DATA        3B106480
0BD5 0 0001               STO     *+1         WORD STORED                3B106490
0BD6 0 C400 0AE2          LO   L  SLOBE                                  3B106500
0BD8 0 7000               MDX     *                                      3B106510
                       *                                                 3B106520
0BD9 0 7011               MDX     ALT00                                  3B106530
0BDA 0 7013               MDX     ALT01                                  3B106540
                       *                                                 3B106550
0BDB 0 1001            ALT02 SLA     1                                    3B106560
0BDC 0 8400 0AE4          A    L  H0001                                  3B106570
0BDE 0 D480 0AE3          STO  I  ADDRS       STO LAST GOOD DATA         3B106580
0BE0 0 C400 0AE2          LD   L  SLOBE                                  3B106590
0BE2 0 D480 0AE3          STO  I  ADDRS       STO LAST BAD DATA          3B106600
0BE4 0 C480 0AE3          LO   I  ADDRS                                  3B106610
0BE6 0 F400 0AE2          EOR  L  SLDBE       DATA GOOD NOW              3B106620
0BE8 0 4C20 0B8F          BSC  L  ERROR+1,Z   *NO,BRANCH                 3B106630
                       *                                                 3B106640
0BEA 0 70D7               MDX     NWAIT                                  3B106650
                       *                                                 3B106660
0BEB 0 F400 0AE5       ALT00 EOR  L  HFFFF                               3B106670
0BED 0 70F0               MDX     ALT02+3                                3B106680
                       *                                                 3B106690
0BEE 0 1001            ALT01 SLA     1                                    3B106700
0BEF 0 70EE               MDX     ALT02+3                                3B106710
                       *                                                 3B106720
                       *          CONSTANTS   IOCC TABLE                 3B106730
                       *                                                 3B106740
0BF0   0000               BSS  E                                         3B106750
0BF0 0 4C00 0961       LINK  BSC  L  CRSIZ                               3B106760
0BF2 0 0C0B            ROSWS OC      SWS                                 3B106770
0BF3 0 3A00               OC      /3A00                                  3B106780
0BF4 0 0C50            VECTR OC      INT                                 3B106790
0BF5 0 0C61               OC      STOP                                   3B106800
0BF6 0 0000            SENSE DC      0                                   3B106810
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08F7 0 0F01              DC      /0F01                          3B106820
08F8 0 0C04      RETRN   DC      GR                             3B106830
08F9 0 0900              DC      /0900                          3B106840
08FA 0 08FE      PRNT1   DC      CHAR1                          3B106850
08F8 0 0900              DC      /0900                          3B106860
08FC 0 08FF      PRNT2   DC      CHAR2                          3B106870
08FD 0 0900              DC      /0900                          3B106880
08FE 0 0000      CHAR1   DC      *-*                            3B106890
08FF 0 0000      CHAR2   DC      *-*                            3B106900
0C00 0 0000      SAVE1   DC      *-*                            3B106910
0C01 0 0000              DC      *-*                            3B106920
0C02 0 0000      SAVE2   DC      *-*                            3B106930
0C03 0 0000              DC      0                              3B106940
0C04 0 8500      CR      DC      /8500                          3B106950
0C05 0 0000      MSGAD   DC      *-*                            3B106960
0C06 0 7000      H7000   DC      /7000                          3B106970
0C07 0 00AE      H00AE   DC      /00AE                          3B106980
0C08 0 0006      H0006   DC      /0006                          3B106990
0C09 0 0000      ERRSW   DC      0                              3B107000
0C0A 0 0000      FUNNO   DC      *-*                            3B107010
0C0B 0 0000      SWS     DC      *-*                            3B107020
0C0C 0 0C0C      NOTBL   DC      NDTBL                          3B107030
0C0D 0 C4FC              DC      /C4FC      01                  3B107040
0C0E 0 C4D8              DC      /C4D8      02                  3B107050
0C0F 0 C4DC              DC      /C4DC      03                  3B107060
0C10 0 C4F0              DC      /C4F0      04                  3B107070
0C11 0 C4F4              DC      /C4F4      05                  3B107080
0C12 0 C400              DC      /C4D0      06                  3B107090
0C13 0 C4D4              DC      /C4D4      07                  3B107100
                 *                                              3B107110
                 ************************************************ 3B107120
                 *                                              3B107130
                 *              PROGRAM END ROUTINE             3B107140
                 *                                              3B107150
                 ************************************************ 3B107160
                 *                                              3B107170
0C14 0 4400 0C23 END     BSI  L  PRINT      PRINT END MSG       3B107180
0C16 0 8C69              DC      MSG02+/B000                    3B107190
0C17 0 0C6C              DC      MSG03                          3B107200
0C18 0 C807              LDD     LINK                           3B107210
0C19 0 0C00 0000         STD  L  0                              3B107220
0C1B 0 0806              XIO     RDSWS      READ SWS            3B107230
0C1C 0 C0EE              LD      SWS                            3B107240
0C1D 0 100B              SLA     11         LOOP PROGRAM        3B107250
0C1E 0 4C28 098A         BSC  L  START,Z+   *YES, BRANCH        3B107260
                 *                                              3B107270
0C20 0 3002              WAIT    2          END PROGRAM         3B107280
                 *                                              3B107290
0C21 0 4C00 0961         BSC  L  CRSIZ                          3B107300
                 *                                              3B107310
                 ************************************************ 3B107320
                 *                                              3B107330
                 *              PRINT ROUTINE                   3B107340
                 *                                              3B107350
                 ************************************************ 3B107360
                 *                                              3B107370
0C23 0 0000      PRINT DC        *-*                            3B107380
0C24 0 0BCD              XIO     RDSWS      READ SWS            3B107390
0C25 0 C0E5              LD      SWS                            3B107400
0C26 0 100D              SLA     13         BYPASS PRINT ON     3B107410
0C27 0 4C10 0C30         BSC  L  PRNIT,-    *NO, BRANCH         3B107420
                 *                                              3B107430
0C29 0 7401 0C23 GTOUT   MDX  L  PRINT,1                        3B107440
0C2B 0 C480 0C23         LD   I  PRINT                          3B107450
0C2D 0 4C10 0C55         BSC  L  OUT,-                          3B107460
                 *                                              3B107470
0C2F 0 70F9              MDX     GTOUT                          3B107480
                 *                                              3B107490
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0C30 0 CC00 000C PRNIT LDD  L  12                               3B107500
0C32 0 0C00 0C02        STD  L  SAVE2                           3B107510
0C34 0 C8BF             LOD     VECTR                           3B107520
0C35 0 DC00 000C        STO  L  12         SET INT VECTOR       3B107530
0C37 0 08C0             XIO     RETRN      CARRIER RETURN       3B107540
0C38 0 3006             WAIT    6                               3B107550
                 *                                              3B107560
0C39 0 C480 0C23 GTADR  LO   I  PRINT      GET MSG ADDRS        3B107570
0C3B 0 D0C9             STO     MSGAD                           3B107580
0C3C 0 C480 0C05        LO   I  MSGAD      GET CHAR TO PRINT    3B107590
0C3E 0 F400 0AE5        EOR  L  HFFFF                           3B107600
0C40 0 4C18 0C4E        BSC  L  MSGEN,+-   BR IF TERMINATOR     3B107610
                 *                                              3B107620
0C42 0 F400 0AE5        EOR  L  HFFFF                           3B107630
0C44 0 D0B9             STO     CHAR1      STO FIRST CHAR       3B107640
0C45 0 100B             SLA     8                               3B107650
0C46 0 00BB             STO     CHAR2      STO SECOND CHAR      3B107660
0C47 0 08B2             XIO     PRNT1      PRINT FIRST CHAR     3B107670
0C4B 0 3006             WAIT    6                               3B107680
                 *                                              3B107690
0C49 0 0BB2             XIO     PRNT2      PRINT SECOND CHAR    3B107700
0C4A 0 3006             WAIT    6                               3B107710
                 *                                              3B107720
0C4B 0 7401 0C05        MDX  L  MSGAD,1    INCRE MSG TABLE ADDRS 3B107730
0C4D 0 70EE             MDX     GTADR+3                         3B107740
                 *                                              3B107750
0C4E 0 C4B0 0C23 MSGEN  LD   I  PRINT                           3B107760
0C50 0 4C10 0C55        BSC  L  OUT,-      BR IF LAST MSG SECTION 3B107770
                 *                                              3B107780
0C52 0 7401 0C23        MDX  L  PRINT,1                         3B107790
0C54 0 70E4             MDX     GTADR                           3B107800
                 *                                              3B107810
0C55 0 7401 0C23 OUT    MDX  L  PRINT,1                         3B107820
0C57 0 CC00 0C02        LDD  L  SAVE2                           3B107830
0C59 0 DC00 000C        STD  L  12                              3B107840
0C5B 0 4C80 0C23        BSC  I  PRINT                           3B107850
0C5D 0 0000      INT    DC      *-*                             3B107860
0C5E 0 0B97             XIO     SENSE      SENSE DSW AND RESET  3B107870
0C5F 0 4CC0 0C5D        BOSC I  INT                             3B107880
                 *                                              3B107890
0C61 0 0000      STOP   DC      *-*                             3B107900
0C62 0 300B             WAIT    B          PROG STOP WAIT       3B107910
0C63 0 4CC0 0C61        BDSC I  STOP                            3B107920
                 *                                              3B107930
0C65 0 9A9E      MSG01  DC      /9A9E      ST                   3B107940
0C66 0 3E62             DC      /3E62      AR                   3B107950
0C67 0 9E21             DC      /9E21      T                    3B107960
0C6B 0 FFFF             DC      /FFFF                           3B107970
                 *                                              3B107980
0C69 0 3676      MSG02  DC      /3676      EN                   3B107990
0C6A 0 3221             DC      /3221      O                    3B108000
0C6B 0 FFFF             DC      /FFFF                           3B108010
                 *                                              3B108020
0C6C 0 5E52      MSG03  DC      /5E52      LD                   3B108030
0C6D 0 9221             DC      /9221      W                    3B108040
0C6E 0 1E52             DC      /1E52      CO                   3B108050
0C6F 0 6236             DC      /6236      RE                   3B108060
0C70 0 219E             DC      /219E       T                   3B108070
0C71 0 369A             DC      /369A      ES                   3B108080
0C72 0 9E21             DC      /9E21      T                    3B108090
0C73 0 FFFF             DC      /FFFF                           3B108100
                 *                                              3B108110
0C74 0 1E52      MSG04  DC      /1E52      CO                   3B108120
0C75 0 6236             DC      /6236      RE                   3B108130
0C76 0 219A             DC      /219A       S                   3B108140
0C77 0 22A2             DC      /22A2      IZ                   3B108150
0C78 0 3621             DC      /3621      E                    3B108160
0C79 0 FFFF             DC      /FFFF                           3B108170
```

```
                        *                                                   3B108180
0C7A 0 0936             MSG05 DC      /0936       SR E                      3B108190
0C7B 0 6262                   DC      /6262       RR                        3B108200
0C7C 0 2121                   DC      /2121                                 3B108210
0C7D 0 FFFF                   DC      /FFFF                                 3B108220
                        *                                                   3B108230
0C7E 0 629E             MSG06 DC      /629E       RT                        3B108240
0C7F 0 7621                   DC      /7621       N                         3B108250
0C80 0 0000                   DC      *-*         XX                        3B108260
0C81 0 2121                   DC      /2121                                 3B108270
0C82 0 FFFF                   DC      /FFFF                                 3B108280
                        *                                                   3B108290
0C83 0 2112             MSG07 DC      /2112        F                        3B108300
0C84 0 B276                   DC      /B276       UN                        3B108310
0C85 0 1E21                   DC      /1E21       C                         3B108320
0C86 0 0000                   DC      *-*         YY                        3B108330
0C87 0 FFFF                   DC      /FFFF                                 3B108340
0C88   0961                   END     CRSIZ                                 3B108350
 NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY
```


C R O S S R E F E R E N C E

NAME	VALUE	REFERENCES
ADURS	0AE3	09EF,09F1,09F7,0A12,0A16,0A1B,0A21,0A84,0AB6,0A88,0A8C,0A90,0A91 0A98,0A9A,0A9E,0AA8,0AAB,0AB3,0AB5,0AB9,0AC2,0AC3,0ACB,0ACE,0AD2 0AF7,0AFB,0AFD,0B0A,0B0E,0B13,0B16,0B18,0B1C,0B21,0B22,0B2A,0B2E 0B33,0B34,0B3C,0B41,0B49,0B4F,0BBF,0BCE,0B0E,0BE2,0BE4
ADRCK	0AA7	09FE,0A07,0ABB,0ABF
ADVNC	09A2	09A9
ALTNT	0A7C	0993,0A4B,0A55,0BD2
ALT00	0BEB	0BD9
ALT01	0BEE	0BDA
ALT02	0BDB	0BE0,0BEF
CHAR1	0BFE	0BFA,0C44
CHAR2	0BFF	0BFC,0C46
CHECK	0B1F	0A66,0B2C,0B30
CHEX	0AC1	0A2F,0A42,0AD4,0ADB
CNTRL	0992	09EC,0A0C,0A47,0A5F,0A75
CDMPL	0A7E	0997,0A0E,0A14,0A19,0A27,0A29,0A38,0A3A,0A3C,0A58,0A79,0A97,0AA2 0AA9,0ABC,0ABE,0AD5,0AD7,0AF9,0B04,0B59
CDUNT	0A7B	0A62,0A6E,0B3E,0B47,0B5C
CR	0C04	0BF8
CRSIZ	0961	0971,09B4,0BF0,0C21,0CBB
DOWN	0AED	09E5,0A05,0A40,0AF3
END	0C14	09A6
ENDPT	0AE7	0A9B,0AB6,0ACF,0ADE,0AF1
ERR	0B69	0B28,0B3A,0B72
ERROR	0B8E	0A95,0AAF,0AC7,0B01,0B6E,0B9D,0BD0,0BE8
ERRSW	0C09	0990,0B7E,0B8C,0BC4
FFFF	09D6	09D9,DA18,0A56
FILL	DA81	09DA,DABA,0A8E
FIND	0B4E	0B14,0B61,0B67,086A
FLIP	0A8F	09DE,09E7,0AA0,0AA5
FLOAT	0AF5	0A4D,0A5A,0B09,0B0C,0B10
FNDSZ	0985	096C,0979
FUNND	0C0A	0999,09E3,DA03,0A34,0A52,0A6B,0B9E,0BB7
FUN11	09DC	09E2
FUN12	09E5	09E8
FUN21	09FC	0A02
FUN22	0A05	0A0B
FUN31	0A29	0A33
FUN32	0A3A	0A46
FUN42	0A54	0A5E
FUN61	0A66	0A6A
FUN62	0A6D	0A74
GTADR	0C39	0C4D,0C54
GTDUT	0C29	0C2F
HFFFF	0AE5	0A77,0AA3,0AB2,0ABD,0ACA,0AD6,0AEE,0B27,0B39,0B4C,0B58,0B65,0B70 0BEB,0C3E,0C42
H00AE	0C07	0B98
H000A	09D4	
H0001	0AE4	0986,09F9,0A23,0A49,0A8D,0ADB,0B0F,0B1D,0B2F,0B4A,08A0,0BB9,0BDC
H0002	0A7D	0A54
H0004	0A7F	0A6D,0B45
H0006	0C08	0899
H1000	09D3	0961
H5555	09D7	0A0D,0A26
H7000	0C06	0BD4
H8000	0AEA	0AF8
INCRE	0AE8	0A9F,0ABA,0AD3,0ADC,0AEF
INT	0C5D	0BF4,0C5F
INVRT	0B4C	0B37
LINK	0BF0	0966,0973,097B,0B93,0C1B
LOKFN	0B74	09E0,09E9,0A00,0A09,0A31,0A44,0A4F,0A5C,0A6B,0A72,0B79,0B81,0B83 0BB9,0B80
LOOPA	0BD2	0BC6
LPRTN	09A8	09C1,09C4,09CA
LRTN	09DB	09A5,09C3
LWRLM	0AEB	09ED,0AB3,0ADF,0AF0,0AF6,0B12,0B20,0B32

```
MSGAD   0C05  0C3B,0C3C,0C4B
MSGEN   0C4E  0C40
MSG01   0C65  09BC,09BC
MSG02   0C69  0C16
MSG03   0C6C  09BD,0C17
MSG04   0C74  09B2
MSG05   0C7A  09B1,0BAA
MSG06   0C7E  09B3,09B0,0BAB
MSG07   0C83  0BA6,0BAC
NOTBL   0C0C  09AE,0BA2,0C0C
NWAIT   0BC2  0BAF,0BEA
OUT     0C55  0C2D,0C50
PASS    0A80  0995,0B75,0B77,0B7C
PRINT   0C23  097F,09BA,09BA,0BA8,0C14,0C29,0C2B,0C39,0C4E,0C52,0C55,0C5B
PRNIT   0C30  0C27
PRNT1   0BFA  0C47
PRNT2   0BFC  0C49
RDSWS   0BF2  099B,0B85,0B96,0BC2,0C1B,0C24
RETRN   0BFE  0C37
RID     09D5  098F,09A2,09A4,09AB,09A0,09C9,0BBC
RTN1    09D9  09CC
RTN2    09ED  09C0,09FB
RTN3    0A00  09CE,0A25
RTN4    0A49  09CF,0A51
RTN5    0A61  0900,0A7A
RTN6    0A77  09D1
RTTBL   09CB  09AB,09CB
SAVE1   0C00  0B91,0BC8
SAVE2   0C02  0C32,0C57
SENSE   0BF6  0C5E
SHAKE   0B31  0A70,0840,0B43,0B4B
SIZE    09D2  0962,0968,096E,0970,0975,0985,0988
SLDBE   0AE2  0A2B,0A36,0A3E,0AB2,0A85,0A94,0AA1,0AA4,0AAA,0AAE,0AB1,0AC6,0AC9
              0ACD,0AFA,0B00,0B03,0B5B,0B60,0B63,086C,0BB1,0BCC,0B06,0BE0,0BE6
SLRTN   09C0  09A0
START   098A  0C1E
STUP    0C61  0BF5,0C63
STURE   0B3C  0B4D
STRTN   09BE  09AC,09B8
SWS     0C0B  099D,09B5,09C6,0BB6,0B97,0BAD,0BC3,0BF2,0C1C,0C25
TEMP    0AE9  0B51,0B53
UP      0ADA  090C,09FC,0A10,0A2D,0AE0
UPRLM   0AEC  09F3,0A10,0AB9,0A0D,0AF2,0B0B,0B19,0B2B,0B42
VECTR   0BF4  0C34
WAS     0AE6  0A93,0AA0,0AC5,0AFF,0B24,0B36,0BB4
WORST   0B11  0A64,0B1A,0B1E

        END OF ASSEMBLY
```

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TABLE OF CONTENTS

I. PURPOSE

A. TO CHECK THE ACCURACY OF ALL OF THE USE METERS.
B. WHEN THE II31 USE METER IS SWITCHED TO C.E MODE, ONLY THE C.E. METER AOVANCES.

2. PREREQUISITES

2.I PROGRAM

THIS PROGRAM DOES NOT RUN UNDER CONTROL OF THE 1130 DIAGNOSTIC MONITOR. USES THE RELOCATABLE OIANOSTIC LOADER FOR THE 1442 OR THE 2501.

2.2 EQUIPMENT

CUSTOMER ENGINEER USE METER KEY.

3. USE PROCEOURE

3.I PROGRAM LOADING

TO LOAO FROM CARDS

A. PLACE THE RELOCATING LOADER, AND THE METER TEST IN THE READER IN THAT ORDER.
B. MAKE READER READY.
C. PRESS THE 1131 RESET KEY.
O. PRESS THE 1131 PROGRAM LOAO KEY.
E. IF THE PROGRAM FAILS TO LOAD OR STOPS AT A WAIT BELOW ADDRESS /0160 REFER TO THE RELOCATING LOADER DOCUMENTATION.

TO LOAO FROM PAPER TAPE

A. PLACE THE RELOCATING LOADER IN THE READER.
B. MAKE THE READER READY.
C. PRESS THE 1131 RESET KEY.
O. PRESS THE 1131 PROGRAM LOAO KEY.
E. LOADER WILL LOAD AND HALT AT WAIT 30F6 (B REG).
F. PLACE THE METER TEST IN THE READER.
G. MAKE THE READER READY.

H. PRESS PROGRAM START.
I. IF PROGRAM FAILS TO LOAO OR STOPS AT A WAIT BELOW ADDRESS /0160 REFER TO RELOCATING LOADER DOCUMENTATION.

3.2 OPERATION

A. CPU SPEED -- WAIT -1 (30FF = WAIT FF)

SET /FFFF FOR 2.2 US CPU SPEED. SET /0000 FOR 3.6 US CPU SPEED IN ENTRY SWITCHES. PRESS START TO CONTINUE.

B. FILE AREA COOE SELECT -- WAIT 0 (3000)

WAIT ZERO (3000) IS TO SELECT THE FILE THE PROGRAM IS TO RUN WITH. IF OISK IS TO BE BYPASSED OR THERE IS NOT A DISK ON THE SYSTEM THE CONSOLE ENTRY SWITCHES MUST BE SET TO ZERO (0000).

THE FOLLOWING ENTRY SWITCH SETTINGS WILL SELECT THE FILES. ONLY ONE BIT POSITION SHOULD BE SET HOWEVER, THE RIGHT MOST SWITCH SET ON TAKES PRECEDENCE.

ENTRY SWITCH 15 EQUALS BASE FILE
ENTRY SWITCH 14 EQUALS FILE ONE (SEE NOTE - SECTION 5.3)
ENTRY SWITCH 13 EQUALS FILE TWO (SEE NOTE - SECTION 5.3)
ENTRY SWITCH 12 EQUALS FILE THREE (SEE NOTE - SECTION 5.3)
ENTRY SWITCH 11 EQUALS FILE FOUR (SEE NOTE - SECTION 5.3)

C. SELECT SYSTEM I/O UNITS -- WAIT I (3001)

THE SYSTEM I/O CONFIGURATION MUST NOW BE SET IN THE CONSOLE ENTRY SWITCHES. USE THE FOLLOWING FORMAT.

BIT 15 ON = SYSTEM HAS FILE STORAGE.
BIT 14 ON = SYSTEM HAS 1442
BIT 13 ON = SYSTEM HAS 1132
BIT 12 ON = 1403
BIT 10 ON = 1442 M5
BIT 11 ON = 1231
BIT 9 ON = 2501

FOR EXAMPLE, IF A SYSTEM HAS THREE OF THE I/O DEVICES, THEN THREE BIT SWITCHES WOULD BE TURNED ON. (AN EXAMPLE IS--- 2501,1442 M5 & FILE = /0051)

3.2.2 MAKE THE I/O UNITS READY.

1442- PLACE A FEW CARDS IN THE FEED HOPPER AND PRESS THE 1442 START KEY TO MAKE THE 1442 READY.

1132 - TURN ON THE POWER SWITCH, AND PRESS THE 1132 START KEY TO MAKE THE 1132 READY.

PRESS 1131 START BUTTON. PROGRAM WILL GO TO WAIT 2.

3.2.3 NUMBER OF TEST LOOPS -- WAIT 2 (3002)

THIS SECTION WILL BE EXECUTED EITHER IN THE CUSTOMER METER OR CE METER ENVIRONMENT. CUSTOMER ENVIRONMENT IS WITH CE METER OFF AND CE USE KEY IN OFF POSITION.

A. TO CHECK CE MODE

1. SET THE CONSOLE ENTRY SWITCHES TO INDICATE THE NUMBER OF 72 SECOND LOOPS THAT YOU WISH TO MAKE. IF ONE LOOP IS DESIRED, TURN ON BIT 15. IF TWO LOOPS ARE DESIRED, TURN ON BIT 14. ETC.
2. RECORD ALL METER READINGS.
3. PRESS 1131 START KEY.
4. ENTRY SWITCH SETTING OF ZERO WILL BRANCH BACK TO WAIT 2.

NOTE

SEE 3.3 TABLE OF WAITS IF A WAIT OCCURS.

5. PROGRAM WILL STOP AT WAIT A OR B WHEN THE DESIRED DELAY IS COMPLETED. METER ACCURACY SHOULD BE PLUS OR MINUS XX.
6. C.E. METER SHOULD HAVE ADVANCED .02 HOURS FOR EACH LOOP RUN. THE CUSTOMER METERS SHOULD NOT HAVE MOVED.
7. TO REPEAT LOOP, PRESS START KEY.
8. SWITCH 1131 METER OFF OF CE MODE.

B. TO CHECK CUSTOMER METERS

1. SET THE CONSOLE ENTRY SWITCHES TO INDICATE THE NUMBER OF 72 SECOND LOOPS THAT YOU WISH TO MAKE. IF ONE LOOP IS DESIRED, TURN ON BIT 15. IF TWO LOOPS ARE DESIRED, TURN ON BIT 14. ETC.
2. RECORD ALL METER READINGS.
3. PRESS 1131 START KEY.
4. ENTRY SWITCH SETTING OF ZERO WILL BRANCH BACK TO WAIT 2.

NOTE

SEE 3.3 TABLE OF WAITS IF A WAIT OCCURS.

5. PROGRAM WILL STOP AT A WAIT (A OR B) WHEN THE DESIRED DELAY IS COMPLETED. METER ACCURACY SHOULD BE PLUS OR MINUS XX.
6. THE CUSTOMER METERS SHOULD HAVE ADVANCED .02 HOURS FOR EACH LOOP RUN. THE C.E. METER SHOULD NOT HAVE MOVED.
7. TO REPEAT LOOP, PRESS START KEY.

3.2.4 CONTROL CIRCUITRY CHECK

1. WHILE RUNNING THE PROGRAM IN A 72 SECOND DELAY LOOP.

A. THE 1132 METER SHOULD STOP IF THE 1132 CARRIAGE RESTORE OR CARRIAGE SPACE KEY IS PRESSED.

B. THE 1442 METER SHOULD STOP IF THE 1442 NPRO KEY IS PRESSED.

2. CHECK THAT NO METERS ARE MOVING WHILE PROGRAM IS AT WAIT A OR B.
3. WHENEVER THE 1131 METER IS TURNED ON, THERE IS A DELAY CIRCUIT THAT KEEPS THE METER RUNNING FOR A MINIMUM OF 400 MILLISECONDS. TO CHECK THIS CIRCUIT, SET THE 1131 MODE SWITCH TO SINGLE INSTRUCTION(SI). WHEN THE 1131 START KEY IS PRESSED, THE RUN LAMP SHOULD GLOW FOR AN INSTANT (400M.S.) IF TROUBLE IS SUSPECTED AN OSCILLOSCOPE SHOULD BE USED.

3.3 TABLE OF WAITS

WAIT -1 THIS WAIT IS FOR SETTING CPU SPEED INDICATION. SET ENTRY SWITCHES & PRESS START. DEFAULT IS 3.6 US.

WAIT 0 SELECT FILE AREA CODE. (AREA CODE OF FILE TO BE TESTED.) PRESS START.

WAIT 1 SET THE I/O CONFIGURATION IN THE CONSOLE ENTRY SWITCHES. PRESS THE 1131 START BUTTON.

WAIT 2 SET THE CONSOLE ENTRY SWITCHES TO INDICATE THE NUMBER OF 72 SECOND (.02 HOURS) LOOPS DESIRED. PRESS 1131 START BUTTON TO BEGIN TEST.

WAIT 3 THE 1442 IS NOT READY OR THE INTERRUPT WAS LOST. TO PROCEED, PRESS START. TO RETRY, PRESS CPU RESET AND START BUTTONS.

WAIT 4 THE 1132 IS NOT READY OR THE INTERRPUT WAS LOST. TO PROCEED, PRESS START. TO RETRY, PRESS CPU RESET AND START BUTTONS.

WAIT 5 THE 1403 IS NOT READY OR THE INTERRUPT WAS LOST. TO PROCEED, PRESS START. TO RETRY, PRESS CPU RESET AND START BUTTONS. THIS IS FOR TRANSFER ONLY.

WAIT 6 THE DISK IS NOT READY OR THE INTERRUPT WAS LOST. TO PROCEED, PRESS START. TO RETRY, PRESS CPU RESET AND START BUTTONS.

WAIT 7 THE 2501 IS NOT READY OR THE INTERRUPT WAS LOST. TO PROCEED, PRESS START. TO RETRY, PRESS CPU RESET AND START BUTTONS.

WAIT 8 THE 1231 IS NOT READY OR THE INTERRUPT WAS LOST. TO PROCEED, PRESS START. TO RETRY, PRESS CPU RESET AND START BUTTONS.

WAIT 9 THE 1442 M5 IS NOT READY OR THE INTERRUPT WAS LOST. TO PROCEED, PRESS CPU RESET AND START BUTTONS.

WAIT A END OF PROGRAM LOOP PASSES USING CPU ONLY. PRESS START TO REPEAT TEST.

WAIT B END OF PROGRAM LOOP PASSES USING CPU AND DISK ONLY. PRESS START TO REPEAT TEST.

WAIT C LOST NTRPT OR ERROR AFTER 80 COLUMN READ. OP COMPLETE FOR END OF CARD. PRESS START TO PROCEED. PRESS CPU RESET & START TO RETRY.

WAIT D LOST NTRPT OR ERROR ON 1403 PRINT OP COMPLETE. PRESS START TO PROCEED. PRESS CPU RESET & START TO RETRY.

3.4 TERMINATIONS

THE PROGRAM WILL STOP AT WAIT A OR B WHEN THE TEST IS COMPLETED.
TO REPEAT TEST, PRESS 1131 START BUTTON.

4. PRINTOUTS (NONE)

5. COMMENTS

THE TESTING METHOO IS ACCOMPLISHED ONE OF TWO WAYS.

1. IF THE SYSTEM IS EQUIPPEO WITH OISK STORAGE, 7.2 SECONDS OF EACH 72 SECONO DELAY LOOP WILL BE USEO TO ACCESS THE DISK CARRAIGE. THIS CHECKS THE CIRCUITRY TO THE 'USE METER' FROM THE 'SEEK' CIRCUITS. THE REMAINING 64.8 SECONO OELAY IS ACCOMPLISHEO BY AODITION IN THE ACCUMULATOR. 7.2 SECONOS = ONE OIVISION ON THE 'USE METER'.

2. IF THE SYSTEM IS NOT EQUIPPED WITH OISK STORAGE, THE ENTIRE 72 SECOND DELAY IS ACCOMPLISHED IN THE ACCUMULATOR.

3. NOTE -- THE USE METERS AND THE RUN LITE OO NOT OPERATE CONTINUOUSLY WHEN USING FILES 1,2,3 AND 4. THE RUN LITE WILL GO OUT AND THE USE METERS WILL STOP MOMENTARILY WHILE THE FILES ARE ACCESSING. THIS ACCOUNTS FOR THE DIFFERENCE OR APPARENT ERROR IN METER READINGS. THIS APPLIES ONLY TO THE 1133 FILES ANO NOT TO FILE 0.

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```
                        A8S                                                 3A400020
01F4                    ORG     500                                         3A400030
01F4 0 03A4             DC      /03A4       PID                             3A400040
                    *                                                       3A400050
                    ********************************************          3A400060
                    * INTERRUPT TRANSFER VECTORS                 *          3A400070
                    ********************************************          3A400080
01F5 0 6500 0351    8EGIN LDX   L1 INT1                                     3A400090
01F7 0 6D00 0009          STX   L1 /0009                                    3A400100
01F9 0 6500 0356          LDX   L1 INT2                                     3A400110
01F8 0 6D00 000A          STX   L1 /000A                                    3A400120
01FD 0 6500 0358          LDX   L1 INT4                                     3A400130
01FF 0 6D00 000C          STX   L1 /000C                                    3A400140
                    *                                                       3A400150
                    ********************************************          3A400160
                    *                                          *          3A400170
                    *     RE-INITIALIZATION SU8RTN             *          3A400180
                    *                                          *          3A400190
                    ********************************************          3A400200
0201 0 6500 6004          LDX   L1 /6004      ZERO ADDR INST                3A400210
0203 0 6D00 0000          STX   L1 0          SET IT IN ADDR ZERO           3A400220
0205 0 6500 6400          LDX   L1 /6400      8R INST                       3A400230
0207 0 6D00 0004          STX   L1 4          SET IN ADDR 4                 3A400240
0209 0 6500 01F5          LDX   L1 8EGIN      GET ADDR                      3A400250
020B 0 6D00 0005          STX   L1 5          SET IN ADDR 5                 3A400260
020D 0 6100               LDX     1 0         CLEAR INDEX                   3A400270
020E 0 6D00 0001          STX   L1 1          SET IN ADDR 1                 3A400280
0210 0 6200               LDX     2 0         CLEAR INDEX                   3A400290
0211 0 6E00 0002          STX   L2 2          SET IN ADDR 2                 3A400300
0213 0 6300               LDX     3 0         CLEAR INDEX                   3A400310
0214 0 6F00 0003          STX   L3 3          SET IN ADDR 3                 3A400320
                    *                                                       3A400330
                    ********************************************          3A400340
                    *                                          *          3A400350
                    *          CPU CLOCK SPEED SU8RTN          *          3A400360
                    *             SET ENTRY SWITCH             *          3A400370
                    *             TO /FFFF FOR 2.2             *          3A400380
                    *             TO /0000 FOR 3.6             *          3A400390
                    *                                          *          3A400400
                    ********************************************          3A400410
                    *                                                       3A400420
0216 0 30FF               WAIT X  -1          CPU CLOCK SPEED               3A400430
                    *                                                       3A400440
0217 0 0C00 0364          XIO   L CESWS       READ ENTRY SW DATA            3A400450
0219 0 C400 0388          LD    L COUNT       GET DATA                      3A400460
0218 0 F400 0497          EOR   L XFFFF       TEST FOR /FFFF                3A400470
021D 0 4818               BSC     +-          SKIP IF NOT ZERO              3A400480
021E 0 7002               MDX     CPUXX       8R TO SET 2.2 US SW           3A400490
021F 0 1010               SLA     16          CLEAR A REG                   3A400500
0220 0 7002               MDX     CPUXX+2     8R TO SET 3.6 US SW           3A400510
                    *                                                       3A400520
0221 0 C400 0497    CPUXX LD    L XFFFF       GET XTNT                      3A400530
0223 0 D400 0496          STO   L CLOCK       SET CLOCK SW IND              3A400540
                    *                                                       3A400550
                    *                                                       3A400560
                    ********************************************          3A400570
                    *                                          *          3A400580
                    *     CLEAR 1132 AND SET 1403 I/O AREA     *          3A400590
                    *                                          *          3A400600
                    ********************************************          3A400610
0225 0 6142               LDX     1 66        SET LDX CTRL                  3A400620
0226 0 6200               LDX     2 0         SET ADDR CTRL                 3A400630
0227 0 C400 0498          LD    L X7F7F       GET DATA CHAR                 3A400640
0229 0 D600 0400    PRNTX STO   L2 P1403      SET IN I/O AREA               3A400650
0228 0 7201               MDX     2 1         ADDR ADV                      3A400660
022C 0 71FF               MDX     1 -1        CTRL ADV                      3A400670
022D 0 70F8               MDX       PRNTX     8R LOOP                       3A400680
                    *                                                       3A400690
```



```
022E 0 6220               LDX     2 32                                      3A400700
022F 0 6107               LDX     1 7                                       3A400710
0230 0 C400 0362          LD    L DSWR1       SET ACC TO 0                  3A400720
0232 0 D200         CLEAR STO     2           SET PRINT AREA TO 0           3A400730
0233 0 7201               MDX     2 1                                       3A400740
0234 0 71FF               MDX     1 -1                                      3A400750
0235 0 70FC               MDX       CLEAR                                   3A400760
0236 0 C400 0360          LD    L HOME                                      3A400770
0238 0 D200               STO     2 0         SET LOC 39 TO 0001            3A400780
                    *                                                       3A400790
                    *                                                       3A400800
                    *                                                       3A400810
                    ********************************************          3A400820
                    *                                          *          3A400830
                    *     FILE AREA CODE SETUP SUBRTN          *          3A400840
                    *          SW 15 EQ FILE 0 BASE            *          3A400850
                    *          SW 14 EQ FILE 1                 *          3A400860
                    *          SW 13 EQ FILE 2                 *          3A400870
                    *          SW 12 EQ FILE 3                 *          3A400880
                    *          SW 11 EQ FILE 4                 *          3A400890
                    *                                          *          3A400900
                    ********************************************          3A400910
0239 0 3000         WAITO WAIT    0           SEL FILE WAIT                 3A400920
023A 0 0C00 0364          XIO   L CESWS       READ ENTRY SWITCHES           3A400930
023C 0 C400 0388          LD    L COUNT       GET SWITCH DATA               3A400940
023E 0 4804               BSC     E           SKIP IF EVEN                  3A400950
023F 0 700F               MDX       FILE0     SEL BASE FILE                 3A400960
0240 0 1801               SRA     1           SHIFT TO CK NXT POS           3A400970
0241 0 4804               BSC     E           SKIP IF EVEN                  3A400980
0242 0 700F               MDX       FILE1     SEL FILE 1                    3A400990
0243 0 1801               SRA     1           SHIFT TO CK NXT POS           3A401000
0244 0 4804               BSC     E           SKIP IF EVEN                  3A401010
0245 0 700F               MDX       FILE2     SEL FILE 2                    3A401020
0246 0 1801               SRA     1           SHIFT TO CK NXT POS           3A401030
0247 0 4804               BSC     E           SKIP IF EVEN                  3A401040
0248 0 700F               MDX       FILE3     SEL FILE 3                    3A401050
0249 0 1801               SRA     1           SHIFT TO CK NXT POS           3A401060
024A 0 4804               BSC     E           SKIP IF EVEN                  3A401070
0248 0 700F               MDX       FILE4     SEL FILE 4                    3A401080
024C 0 1010               SLA     16          CLEAR A REG                   3A401090
024D 0 D029               STO       NOFIL     SET FILE SW TO OFF            3A401100
024E 0 7029               MDX       WAIT1     8R BY FILE SEL                3A401110
                    *                                                       3A401120
                    *                                                       3A401130
024F 0 6500 2000    FILE0 LDX   L1 /2000      GET AREA CODE                 3A401140
0251 0 7008               MDX       FILAC     8R TO SETUP CTRLS             3A401150
0252 0 6500 8800    FILE1 LDX   L1 /8800      GET AREA CODE                 3A401160
0254 0 7008               MDX       FILAC     8R TO SETUP CTRLS             3A401170
0255 0 6500 9000    FILE2 LDX   L1 /9000      GET AREA CODE                 3A401180
0257 0 7005               MDX       FILAC     8R TO SETUP CTRLS             3A401190
0258 0 6500 9800    FILE3 LDX   L1 /9800      GET AREA CODE                 3A401200
025A 0 7002               MDX       FILAC     8R TO SETUP CTRLS             3A401210
0258 0 6500 A000    FILE4 LDX   L1 /A000      GET AREA CODE                 3A401220
                    *                                                       3A401230
                    *                                                       3A401240
025D 0 6915         FILAC STX     1 ACHLD     SAVE AREA CODE                3A401250
025E 0 C014               LD        ACHLD     GET AREA CODE                 3A401260
025F 0 E816               OR        FRSET     OR IN FUNCTION                3A401270
0260 0 D400 0363          STO   L DSWR1&1     SET NEW INST                  3A401280
0262 0 F013               EOR       FRSET     CLEAR FUNCTION                3A401290
0263 0 E810               OR        ARMOT     OR IN FUNCTION                3A401300
0264 0 D400 0377          STO   L DLY2&1      SET NEW INST                  3A401310
0266 0 D400 0378          STO   L DLY4&1      SET NEW INST                  3A401320
0268 0 D400 0361          STO   L HOME&1      SET NEW INST                  3A401330
026A 0 F009               EOR       ARMOT     CLEAR FUNCTION                3A401340
0268 0 E809               OR        ARMIN     OR IN FUNCTION                3A401350
026C 0 D400 0375          STO   L DLY1&1      SET NEW INST                  3A401360
026E 0 D400 0379          STO   L DLY3&1      SET NEW INST                  3A401370
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0270 0 F004                EOR     ARMIN       CLEAR FUNCTION                3A401380
0271 0 D005                STO     NOFIL       SET FILE SW TO FILE X         3A401390
0272 0 7005                MDX     WAIT1       BR TO CONTINUE                3A401400
                     *                                                        3A401410
                     *                                                        3A401420
0273 0 0000          ACHLO OC      0           AREA CODE HOLDER              3A401430
                     *                                                        3A401440
0274 0 0404          ARMOT DC      /0404       SEEK OUT INST FNCTN           3A401450
                     *                                                        3A401460
0275 0 0400          ARMIN DC      /0400       SEEK IN INST FNCTN            3A401470
                     *                                                        3A401480
0276 0 0701          FRSET DC      /0701       SENSE RESET DSW               3A401490
                     *                                                        3A401500
0277 0 0000          NOFIL OC      0           NO FILE -- PGM SW             3A401510
                     *                                                        3A401520
                     ********************************************             3A401530
                     * READ THE CONSOLE ENTRY SWITCHES TO                     3A401540
                     * DETERMINE THE SYSTEM CONFIGURATION                     3A401550
                     *           BIT 15 # DISK                                3A401560
                     *           BIT 14 # 1442                                3A401570
                     *           BIT 13 # 1132                                3A401580
                     *           BIT 12 # 1403                                3A401590
                     *           BIT 11 # 1231                                3A401600
                     *           BIT 10 # 1442 M 5                            3A401610
                     *           BIT  9 # 2501                                3A401620
                     ********************************************             3A401630
0278 0 3001          WAIT1 WAIT    1           ENTER SYS CONF.               3A401640
0279 0 0C00 0364           XIO  L  CESWS                                       3A401650
027B 0 C400 0388           LD   L  COUNT                                       3A401660
027D 0 D400 0389           STO  L  DISK1                                       3A401670
027F 0 1801                SRA     1                                           3A401680
0280 0 D400 038A           STO  L  SRP1        1442                          3A401690
0282 0 1801                SRA     1                                           3A401700
0283 0 D400 038B           STO  L  PRTR2       1132                          3A401710
0285 0 1801                SRA     1                                           3A401720
0286 0 D400 038C           STO  L  HPTR1       1403                          3A401730
0288 0 1801                SRA     1                                           3A401740
0289 0 0400 038D           STO  L  OMR1        1231                          3A401750
028B 0 1801                SRA     1                                           3A401760
028C 0 D400 038E           STO  L  PUO1        1442M5                        3A401770
028E 0 1801                SRA     1                                           3A401780
028F 0 D400 038F           STO  L  ROHS1       2501                          3A401790
0291 0 C400 0389           LD   L  OISK1                                       3A401800
0293 0 4804                BSC     E                                           3A401810
0294 0 706C                MDX     DISK                                        3A401820
                     *                                                        3A401830
                     ********************************************             3A401840
                     * READ THE CONSOLE ENTRY SWITCHES                        3A401850
                     *                                                        3A401860
                     * START THE 1132,1442,1403, 1231, 1442M5 AND             3A401870
                     * 2501 METERS IF SELECTED.                               3A401880
                     *                                                        3A401890
                     ********************************************             3A401900
0295 0 3002          WAIT2 WAIT    2           ENTER NO OF DLY LOOPS         3A401910
0296 0 0C00 0364     SENSE XIO  L  CESWS       SENSE CON ENTRY SWS           3A401920
0298 0 C400 0388           LD   L  COUNT       GET COUNT                     3A401930
029A 0 4C18 0295           BSC  L  WAIT2,&-    BR IF ZERO                    3A401940
                     *                                                        3A401950
029C 0 6780 0388           LDX  I3 COUNT       XR3# LOOP COUNT               3A401960
029E 0 C400 038A           LD   L  SRP1                                      3A401970
02A0 0 4804                BSC     E                                         3A401980
02A1 0 704E                MDX     SRP2        START 1442                    3A401990
                     *                                                        3A402000
02A2 0 C400 038B     SNS1  LD   L  PRTR2                                     3A402010
02A4 0 4804                BSC     E                                         3A402020
02A5 0 7056                MDX     PRTR3       START 1132                    3A402030
                     *                                                        3A402040
02A6 0 C400 038C     SNS3  LD   L  HPTR1                                     3A402050
```



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02A8 0 4804                BSC     E                                         3A402060
02A9 0 7014                MDX     HPTR2       START 1403                    3A402070
                     *                                                        3A402080
02AA 0 C400 0380     SNS6  LD   L  UMR1                                      3A402090
02AC 0 4804                BSC     E                                         3A402100
02AD 0 701F                MDX     UMR2        START 1231                    3A402110
                     *                                                        3A402120
02AE 0 C400 038E     SNS7  LD   L  PUO1                                      3A402130
02B0 0 4804                BSC     E                                         3A402140
02B1 0 7026                MDX     PUO2        START 1442 M 5                3A402150
                     *                                                        3A402160
02B2 0 C400 038F     SNS8  LO   L  RDHS1                                     3A402170
02B4 0 4804                BSC     E                                         3A402180
02B5 0 702E                MDX     RDHS2       START 2501                    3A402190
                     *                                                        3A402200
02B6 0 C0C0          SNS2  LD      NOFIL       GET FILE IND SW               3A402210
02B7 0 4C18 0315           BSC  L  ADD1,+-     BR IF NO FILE IND             3A402220
02B9 0 C400 0389           LD   L  OISK1       GET SEL DISK CTRL             3A402230
02BB 0 4804                BSC     E           TEST                          3A402240
02BC 0 7072                MDX     TEST0       BR IF FILE PRESENT & SEL      3A402250
02BD 0 7057                MOX     ADD1        BR IF NO FILE/SEL             3A402260
                     *                                                        3A402270
                     *                                                        3A402280
02BE 0 6600 0380     HPTR2 LDX  L2 OSWR4                                     3A402290
02C0 0 6E00 035D           STX  L2 INT4&2                                    3A402300
02C2 0 0C00 036C           XIO  L  HPTR        START 1403                    3A402310
02C4 0 3005          WAIT5 WAIT    5           NO RESPONSE FROM 1403         3A402320
02C5 0 1001                SLA     1           SHIFT FOR OP CMPLT            3A402330
02C6 0 4810                8SC     -           SKIP IF OP CMPLT              3A402340
02C7 0 70F6                MDX     HPTR2       ERROR BR TO RETRY             3A402350
02C8 0 300D          WAITD WAIT X  /0D         NROY/LST NTRPT WAIT           3A402360
02C9 0 1002                SLA     2           SHIFT TO CK AGAIN             3A402370
02CA 0 4810                BSC     -           SKIP IF OP CMPLT              3A402380
02CB 0 70FC                MDX     WAITD       WAIT LOOP                     3A402390
02CC 0 70DD                MDX     SNS6        BR TO CONTINUE                3A402400
                     *                                                        3A402410
                     *                                                        3A402420
02CD 0 6600 0382     OMR2  LDX  L2 OSWR7                                     3A402430
02CF 0 6E00 035D           STX  L2 INT4&2                                    3A402440
02D1 0 0C00 036E           XIO  L  OMR         START 1231                    3A402450
02D3 0 3008          WAIT8 WAIT    8           NO RESPONSE FROM 1231         3A402460
02D4 0 1801                SRA     1                                         3A402470
02D5 0 4804                8SC     E                                         3A402480
02D6 0 70F6                MDX     OMR2                                      3A402490
02D7 0 70D6                MDX     SNS7        BR TO CONTINUE                3A402500
                     *                                                        3A402510
                     *                                                        3A402520
02D8 0 6600 0384     PUO2  LDX  L2 OSWR8                                     3A402530
02DA 0 6E00 035D           STX  L2 INT4&2                                    3A402540
02DC 0 0C00 0370           XIO  L  PUO         START 1442 M 5                3A402550
02DE 0 3009          WAIT9 WAIT    9           NO RESPONSE FROM 1442M5       3A402560
02DF 0 F400 049A           EOR  L  X0800       TEST FOR OK 8ITS              3A402570
02E1 0 4820                BSC     Z           SKIP IF OK                    3A402580
02E2 0 70F5                MDX     PUO2                                      3A402590
02E3 0 70CE                MDX     SNS8        BR TO CONTINUE                3A402600
                     *                                                        3A402610
                     *                                                        3A402620
02E4 0 6600 0386     RDHS2 LDX  L2 OSWR9                                     3A402630
02E6 0 6E00 035D           STX  L2 INT4&2                                    3A402640
02E8 0 0C00 0372           XIO  L  RDHS        START 2501                    3A402650
02EA 0 3007          WAIT7 WAIT X  /07         NRDY/LST NTRPT                3A402660
02E8 0 F400 049A           EOR  L  X0800       TEST FOR OK 8ITS              3A402670
02ED 0 4820                BSC     Z           SKIP IF OK                    3A402680
02EE 0 70F5                MDX     RDHS2       BR IF NOT OK                  3A402690
02EF 0 70C6                MDX     SNS2        BR TO CONTINUE                3A402700
                     *                                                        3A402710
                     *                                                        3A402720
02F0 0 6600 037C     SRP2  LOX  L2 DSWR2       GET NTRPT ADDR                3A402730
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02F2 0 6E00 035D          STX  L2 INT4&2      SET IT IN NTRPT RTN          3A402740
02F4 0 0C00 0366          XIO  L  SRP         START 1442                   3A402750
02F6 0 3003       WAIT3   WAIT    3           NO RESP. FROM 1442           3A402760
02F7 0 F400 049A          EOR  L  X0800       TEST FOR OK BITS             3A402770
02F9 0 4820               BSC     Z           SKIP IF OK                   3A402780
02FA 0 70F5               MDX     SRP2                                     3A402790
02FB 0 70A6               MDX     SNS1                                     3A402800
                  *                                                        3A402810
                  *                                                        3A402820
02FC 0 0C00 0368  PRTR3   XID  L  PRTR        START 1132.                  3A402830
02FE 0 3004       WAIT4   WAIT    4           NO RESP. FROM 1132           3A402840
02FF 0 086A               XID     PRTR1       STOP THE 1132 INTR           3A402850
0300 0 70A5               MDX     SNS3        BR TO CONTINUE               3A402860
                  *                                                        3A402870
                  *                                                        3A402880
                  ******************************************               3A402890
                  * SET DISK TO HOME                        *              3A402900
                  ******************************************               3A402910
0301 0 C400 0277  DISK    LD   L  NOFIL       GET NO FILE SW               3A402920
0303 0 4C18 0295          BSC  L  WAIT2,&-    BR IF NO FILE SEL            3A402930
0305 0 0C00 0362          XIO  L  DSWR1       SENSE DISK DSW               3A402940
0307 0 1002               SLA     2                                        3A402950
0308 0 4C28 0313          BSC  L  WAIT6,Z&    IF NOT RDY GO TO WR6         3A402960
030A 0 1002               SLA     2                                        3A402970
030B 0 4C28 0295          BSC  L  WAIT2,&Z    IS CARR HOME                 3A402980
030D 0 6600 0362  SEEK    LDX  L2 DSWR1                                    3A402990
030F 0 6E00 0358          STX  L2 INT2&2                                   3A403000
0311 0 0C00 0360          XIO  L  HOME        SEEK -1 CYL                  3A403010
0313 0 3006       WAIT6   WAIT X  /06         DISK LOST NTRPT/NRDY         3A403020
0314 0 70F0               MDX     DISK&4      BR TO RETRY                  3A403030
                  ******************************************               3A403040
                  * METER TEST                                            3A403050
                  * 72 SECOND DELAY USING DNLY THE CPU                     3A403060
                  ******************************************               3A403070
0315 0 C400 0496  ADD1    LD   L  CLOCK       GET CPU SPEED SW             3A403080
0317 0 4820               BSC     Z           SKIP IF 3.6 US               3A403090
0318 0 700C               MDX     FASTX       BR FOR 2.2 US RTN            3A403100
                  *                                                        3A403110
0319 0 6148               LDX  1  72          CONSTANT                     3A403120
031A 0 C075       ADD2    LD      NUM                                      3A403130
031B 0 8044       ADD3    A       HOME        ADD 1 TO ACCUM               3A403140
031C 0 4820               BSC     Z                                        3A403150
031D 0 70FD               MDX     ADD3                                     3A403160
031E 0 71FF               MDX  1  -1          MODIFY CONSTANT              3A403170
031F 0 70FA               MDX     ADD2                                     3A403180
0320 0 73FF               MDX  3  -1          MODIFY LOOP COUNT            3A403190
0321 0 70F3               MDX     ADD1                                     3A403200
0322 0 300A       WAITA   WAIT X  /0A         CPU ONLY E.O.P.              3A403210
0323 0 4C00 0239          BSC  L  WAIT0       BR TO REPEAT TEST            3A403220
                  *                                                        3A403230
                  *                                                        3A403240
0325 0 6158       FASTX   LDX  1  88          LOOP CTRL NDX CNT            3A403250
0326 0 10A0               SLT     32          CLEAR A & Q REG              3A403260
                  *                                                        3A403270
0327 0 8400 0360          A    L  HOME        ADD ONE TO COUNT             3A403280
0329 0 4C02 032C          BSC  L  ADD4,C      BRANCH IF CARRY ON           3A403290
032B 0 70FB               MDX     FASTX&2     BR LOOP                      3A403300
                  *                                                        3A403310
032C 0 71FF       ADD4    MDX  1  -1          DEC CTRL                     3A403320
032D 0 70F8               MDX     FASTX&1     BR TO REDO CTR RTN           3A403330
032E 0 70F1               MDX     WAITA-2     BR TO PGM END CTRL           3A403340
                  *                                                        3A403350
                  *                                                        3A403360
                  ******************************************               3A403370
                  * METER TEST                                            3A403380
                  * 72 SECOND DELAY USING THE DISK AND THE CPU*            3A403390
032F 0 6500 0362  TESTO   LDX  L1 DSWR1       GET INTERRUPT ADDR           3A403400
0331 0 6D00 0358          STX  L1 INT2&2      SET ADDR IN NTRPT RTN        3A403410
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0333 0 0C00 0374           XIO  L  DLY1       SEEK&202 CYL                 3A403420
0335 0 3000                WAIT                                            3A403430
0336 0 083F                XIO     DLY2       SEEK-202 CYL                 3A403440
0337 0 3000                WAIT                                            3A403450
0338 0 083B                XIO     DLY1       SEEK&202 CYL                 3A403460
0339 0 3000                WAIT                                            3A403470
033A 0 083B                XIO     DLY2       SEEK-202 CYL                 3A403480
033B 0 3000                WAIT                                            3A403490
033C 0 083B                XIO     DLY3       SEEK&76 CYL                  3A403500
033D 0 3000                WAIT                                            3A403510
033E 0 083B                XIO     DLY4       SEEK-76 CYL                  3A403520
033F 0 3000                WAIT                                            3A403530
0340 0 C400 0496           LD   L  CLOCK       GET CPU SPEED                3A403540
0342 0 4820                BSC     Z          SKIP IF 3.6 US CLOCK         3A403550
0343 0 7002                MDX     TESTX      BR FOR 2.2 US SETUP          3A403560
                  *                                                        3A403570
0344 0 613C                LDX  1  60         CTRL CNT                     3A403580
0345 0 7001                MDX     TESTX&1    BR TO SET UP 3.6 US          3A403590
                  *                                                        3A403600
0346 0 6161       TESTX    LDX  1  97         SET 2.2 US CTRL CNT          3A403610
0347 0 8018       ADD      A       HUME       ADD 1 TO ACCUM               3A403620
0348 0 4820                BSC     Z                                       3A403630
0349 0 70FD                MDX     ADD                                     3A403640
034A 0 71FF                MDX  1  -1         MODIFY CUNSTANT              3A403650
034B 0 70FB                MDX     ADD                                     3A403660
034C 0 73FF                MDX  3  -1         MODIFY LOOP COUNT            3A403670
034D 0 70E1                MDX     TESTO                                   3A403680
034E 0 300B       WAITB    WAIT X  /0B        CPU + FILE E.O.P             3A403690
034F 0 4C00 0239           BSC  L  WAIT0      BR TO REPEAT TEST            3A403700
                  *                                                        3A403710
                  ******************************************               3A403720
                  * INTERRUPT SUBRDUTINES                   *              3A403730
                  ******************************************               3A403740
0351    0001      INT1     BSS     1          1132                         3A403750
0352 0 0C00 037E           XIO  L  DSWR3      SENSE DSW                    3A403760
0354 0 4CC0 0351           BOSC I  INT1                                    3A403770
0356    0001      INT2     BSS     1          DISK                         3A403780
0357 0 0C00 0000           XID  L  *-*        SENSE DSW                    3A403790
0359 0 4CC0 0356           BDSC I  INT2                                    3A403800
035B    0001      INT4     BSS     1          INTERRUPT LEVEL 4            3A403810
035C 0 0C00 0000           XIO  L  *-*        SENSE DSW                    3A403820
035E 0 4CC0 035B           BOSC I  INT4                                    3A403830
                  *                                                        3A403840
                  ******************************************               3A403850
                  * I/O CONTROL COMMANDS AND CONSTANTS      *              3A403860
                  ******************************************               3A403870
0360    0000               BSS  E  0                                       3A403880
0360 0 0001       HOME     DC      /0001      IOCC TO SEEK HOME            3A403890
0361 0 0000                DC      /0000                                   3A403900
0362 0 0000       DSWR1    DC      /0000      IOCC TO SENSE RESET          3A403910
0363 0 0000                DC      /0000                                   3A403920
0364 0 0388       CESWS    DC      COUNT      IOCC TO RD BIT SWS           3A403930
0365 0 3A00                DC      /3A00                                   3A403940
0366 0 0000       SRP      DC      /0000      IOCC TO START 1442           3A403950
0367 0 1402                DC      /1402       METER                       3A403960
0368 0 0000       PRTR     DC      /0000      IOCC TO START 1132           3A403970
0369 0 3480                DC      /3480       METER                       3A403980
036A 0 0000       PRTR1    DC      /0000      IOCC TO STOP 1132            3A403990
036B 0 3440                DC      /3440       EMIT INTERRUPTS             3A404000
036C 0 0400       HPTR     DC      P1403      START 1403 METER             3A404010
036D 0 AD00                DC      /AD00       METER                       3A404020
036E 0 0000       DMR      DC      /0000      IOCC TO START 1231           3A404030
036F 0 4402                DC      /4402       METER                       3A404040
0370 0 0000       PUD      DC      /0000      IOCC TO START 1442M5         3A404050
0371 0 1402                DC      /1402       METER                       3A404060
0372 0 0443       RDHS     DC      R2501      START 2501 METER             3A404070
0373 0 4E00                DC      /4E00                                   3A404080
0374 0 00CA       DLY1     DC      /00CA      IOCC SEEK TO 202             3A404090
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0375 0 0000                DC      /0000                                    3A404100
0376 0 00CA          OLY2  DC      /00CA      IOCC SEEK TO HOME             3A404110
0377 0 0000                DC      /0000                                    3A404120
0378 0 004C          OLY3  OC      /004C      IOCC SEEK TO 076              3A404130
0379 0 0000                OC      /0000                                    3A404140
037A 0 004C          OLY4  OC      /004C      IOCC SEEK TO HOME             3A404150
037B 0 0000                DC      /0000                                    3A404160
037C 0 0000          OSWR2 OC      /0000      IOCC TO SENSE AND             3A404170
037D 0 1702                DC      /1702       RESET 1442 DSW               3A404180
037E 0 0000          DSWR3 DC      /0000      IOCC TO SENSE ANO             3A404190
037F 0 3701                OC      /3701       RESET 1132 OSW               3A404200
0380 0 0000          OSWR4 DC      /0000      IOCC TO SENSE ANO             3A404210
0381 0 AF01                OC      /AF01       RESET 1403 DSW               3A404220
0382 0 0000          DSWR7 DC      /0000      IOCC TO SENSE ANO             3A404230
0383 0 4701                OC      /4701       RESET 1231                   3A404240
0384 0 0000          DSWR8 DC      /0000      IOCC TO SENSE ANO             3A404250
0385 0 1702                DC      /1702       RESET 1442M5                 3A404260
0386 0 0000          DSWR9 DC      /0000      IOCC TO SENSE ANO             3A404270
0387 0 4F01                DC      /4F01       RESET 2501                   3A404280
0388 0 0000          COUNT DC      /0000      CON ENTRY SW SETTING          3A404290
0389 0 0000          OISK1 OC      *-*        SYSTEM HAS OISK    BIT 15     3A404300
038A 0 0000          SRP1  DC      *-*        SYSTEM HAS 1442        14     3A404310
038B 0 0000          PRTR2 DC      *-*        SYSTEM HAS 1132        13     3A404320
038C 0 0000          HPTR1 OC      *-*        SYSTEM HAS 1403        12     3A404330
038D 0 0000          OMR1  OC      *-*        SYSTEM HAS 1231         11    3A404340
038E 0 0000          PUO1  OC      *-*        SYSTEM HAS 1442M5      10     3A404350
038F 0 0000          ROHS1 OC      *-*        SYSTEM HAS 2501         9     3A404360
0390 0 1340          NUM   DC      /1340                                    3A404370
0400                       ORG     /0400                                    3A404380
                     *                                                      3A404390
0400   0042          P1403 BSS     66         PRINT AREA                    3A404400
0442 0 FFFF                OC      /FFFF                                    3A404410
                     *                                                      3A404420
                     *                                                      3A404430
0443 0 0050          R2501 DC      80                                       3A404440
0444   0050                BSS     80                                       3A404450
0494 0 FFFF                DC      /FFFF                                    3A404460
                     *                                                      3A404470
                     *                                                      3A404480
0496   0000                BSS  E                                           3A404490
                     *                                                      3A404500
                     *                                                      3A404510
0496 0 0000          CLOCK DC      0          CPU CLOCK IND                 3A404520
                     *                                                      3A404530
0497 0 FFFF          XFFFF OC      /FFFF                                    3A404540
                     *                                                      3A404550
0498 0 7F7F          X7F7F OC      /7F7F      PRINT BLANKS                  3A404560
                     *                                                      3A404570
                     *                                                      3A404580
0499 0 0801          X0801 DC      /0801                                    3A404590
                     *                                                      3A404600
049A 0 0800          X0800 OC      /0800                                    3A404610
                     *                                                      3A404620
049C   01F5                END     BEGIN                                    3A404630
  NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY
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SRP     0366  02F4
SRP1    03BA  0280 029E
SRP2    02F0  02A1 02FA
TESTX   0346  0343 0345
TEST0   032F  02BC 034D
WAITA   0322  032E
WAITB   034E
WAITD   02C8  02CB
WAIT0   0239  0323 034F
WAIT1   0278  024E 0272
WAIT2   0295  029A 0303 030B
WAIT3   02F6
WAIT4   02FE
WAIT5   02C4
WAIT6   0313  0308
WAIT7   02EA
WAIT8   02D3
WAIT9   02DE
XFFFF   0497  021B 0221
X0800   049A  02DF 02EB 02F7
X0801   0499
X7F7F   0498  0227
END OF ASSEMBLY
```

TABLE OF CONTENTS

1. PURPOSE

THE CORE ADJUSTMENT PROGRAM LOADS CORE WITH THE BEST CASE AND COMPLEMENT BEST CASE PATTERNS SPECIFIED IN THE ENGINEERING SPECIFICATIONS FOR SJ2 AND SJ4 STORAGE. THIS PATTERN ALLOWS ADJUSTMENT OF THE CORE VOLTAGES AS SPECIFIED IN THE 1130 MAINTENANCE MANUAL.

2. PREREQUISITES

2.1 PROGRAM PREREQUISITES

THE CORE ADJUSTMENT PROGRAM IS LOADED BY THE 1130 RELOCATING LOADER.

2.2 EQUIPMENT PREREQUISITES

A. 1131 CPU
B. CARD OR PAPER TAPE READER

3. USE PROCEDURE

3.1 PROGRAM LOADING

3.1.1 TO LOAD FROM CARDS

A. PLACE RELOCATING LOADER AND PROGRAM DECK IN READER.
B. MAKE READER READY.
C. PRESS THE 1131 RESET KEY.
D. PRESS THE 1131 PROGRAM LOAD KEY.
E. IF PROGRAM FAILS TO LOAD OR STOPS AT A WAIT BELOW LOCATION D160, REFER TO RELOCATING LOADER DOCUMENTATION.

3.1.2 TO LOAD FROM PAPER TAPE

A. PLACE THE PAPER TAPE RELOCATING LOADER IN THE READER.
B. MAKE READER READY.
C. PRESS THE 1131 RESET KEY.
D. PRESS THE 1131 PROGRAM LOAD KEY.
E. THE LOADER SHOULD HALT AT WAIT 30F6 (B REG).
F. PLACE THE CORE ADJUST PROGRAM TAPE IN THE READER.
G. MAKE READER READY.
H. MANUALLY SET THE INSTRUCTION ADDRESS REG TO /0078.
I. SET MODE SWT TO RUN AND PRESS PROGRAM START.
J. IF PROGRAM FAILS TO LOAD OR STOPS AT A WAIT BELOW LOCATION 0160, REFER TO RELOCATIING LOADER DOCUMENTAION.

3.2 OPERATING PROCEDURE (SEE SECTION 5. FOR FURTHER DETAILS)

A. AFTER LOADING THE PROGRAM WILL STOP AT WAIT 3001. SET SWITCHES 14 AND 15 AS DESIRED.

SWT 15..ON..LOAD CORE WITH COMPLEMENT BEST CASE PATTERN.
..OFF.LOAD CORE WITH BEST CASE PATTERN.

SWT 14..ON..EXECUTE HIGH CORE ADJUST SECTION OF PROGRAM.
..OFF.EXECUTE LOW CORE ADJUST SECTION OF PROGRAM.

B. PRESS THE 1131 PROGRAM START BUTTON.

C. THE PROGRAM WILL RUN BRIEFLY LOADING CORE WITH THE PATTERN SELECTED BY SWT 15 AND STOP AT THE END OF THE PROGRAM AT WAIT (3002 OR 3003).

D. REFER TO 1130 MAINTENANCE MANUAL FOR CORE ADJUSTMENT PROCEDURES.

E. TO CHANGE THE CORE ADJUST PATTERN OR RERUN THE PROGRAM.....
1. SET SWT 15 AS DESIRED
2. PRESS THE 1131 RESET KEY.
3. PRESS THE 1131 PROGRAM START KEY.

F. THE PROGRAM MUST BE RELOADED TO CHANGE THE SWT 14 SELECTION.

3.3 PROGRAM HALTS

HALT NO. (B REG)	DESCRIPTION	RESTART ACTION
3DF6	LOADER WAIT. SHOULD OCCUR ON PAPER TAPE IPL ONLY.	A. PLACE CORE ADJUST PROGRAM IN READER. B. MANUALLY SET I REG TO 0D78. C. SET MODE SWT TO RUN. D. PRESS PROGRAM START.
3D01	WAIT FOR SWITCH SETTINGS.	A. SET SWITCH 14... ON..TO ADJUST HIGH CORE. OFF.TO ADJUST LOW CORE. SET SWITCH 15.. ON..FOR COMPLEMENT BEST CASE PATTERN. OFF..FOR BEST CASE PATTERN
3002	END LOW CORE ADJUST.	TO RESTART PROGRAM... A. SET SW 15 AS DESIRED B. PRESS RESET C. PRESS PROGRAM START
3003	END HIGH CORE ADJUST.	

4. PRINTOUTS (NONE)

5. COMMENTS

THE 1130 CORE ADJUST PROGRAM IS MADE UP OF TWO IDENTICAL SECTIONS. THE ONLY DIFFERENCE BETWEEN THESE SECTIONS IS THE CORE LOCATIONS INTO WHICH THEY ARE LOADED. ONLY ONE OF THESE SECTIONS IS EXECUTED FOR EACH TIME THE PROGRAM IS LOADED SINCE EXECUTION OF EITHER SECTION WILL DESTROY THE OTHER.

THE LOW CORE ADJUST SECTION IS SELECTED BY SWT 14 BEING OFF. THIS SECTION IS LOADED INTO THE LAST 2K OF CORE AND IS USED TO ADJUST THE FIRST 8K OF CORE. (THIS SECTION IS ASSEMBLED FOR A 32K MACHINE. IGNORE HIGH ORDER BITS WHEN REFERENCING THE LISTING AND DOCUMENTATION.)

THE HIGH CORE ADJUST SECTION IS SELECTED BY SWT 14 BEING ON. THIS SECTION IS LOADED INTO THE FIRST 2K OF CORE AND IS USED TO ADJUST CORE ABOVE 8K. (THIS SECTION IS NOT USED FOR MACHINES HAVING 8K OR LESS CORE.)

THE CORE ADJUST PROGRAM SHOULD NOT BE EXECUTING WHILE CORE IS BEING ADJUSTED. REFER TO 1130 MAINTENANCE MANUAL FOR CORE ADJUSTMENT PROCEDURE.

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```
                    *****         PRDGRAM ID D3A6                          3A600020
                    ********************************************           3A60D030
                    *                                                      3A600040
********************PRDGRAM WAITS*****************************************3A60D050
*                   *                                                      3A60D060
*      B REG        *             COMMENTS                                 3A60DD70
************************************************************************** 3A600080
                    *                                                      3A600090
       3001         *   SET CONSOLE ENTRY SWITCHES                         3A600100
                    *                                                      3A60D011D
                    *   SWT 15--ON--LDAD CDRE WITH CDMPLEMENT              3A6DD12D
                    *               BEST CASE PATTERN.                     3A60D130
                    *          -OFF--LOAD CORE WITH BEST CASE              3A600140
                    *                PATTERN.                              3A60015D
                    *                                                      3A60D16D
                    *   SWT 14--ON--EXECUTE HIGH CORE ADJUST ROUTINE.      3A60017D
                    *         -OFF--EXECUTE LOW CORE ADJUST RDUTINE.       3A60D180
                    *                                                      3A600190
                    *   PRESS START TD CDNTINUE.                           3A60D2D0
--------------------*--------------------------------------------------- 3A6DD21D
                    *                                                      3A600220
       3002         *   END OF LDW CORE ADJUST ROUTINE.                    3A60D23D
                    *                                                      3A60D240
       3003         *   END OF HIGH CORE ADJUST ROUTINE.                   3A6DD25D
                    *                                                      3A600260
                    *   ADJUST CORE WHILE CYCLING IN AUTOMATIC             3A600270
                    *   DISPLAY MODE.  REFER TD 1130 MAINTENANCE           3A6DD280
                    *   MANUAL FDR ADJUSTMENT PROCEDURE.                   3A600290
************************************************************************** 3A60030D
                    *                                                      3A600310
                      ABS                                                  3A60032D
0000                  ORG     /D15E                                        3A6D0330
015E 0 03A6           DC      /03A6       PID                              3A600340
015F 0 7FFF           DC      /7FFF                                        3A600350
0160                  ORG     /78DD                                        3A60D360
                    ************************************************       3A600370
                    *                                                      3A600380
                    *             PRDGRAM INITIALIZATION                   3A60039D
                    *                                                      3A6D040D
                    ************************************************       3A60041D
                    *                                                      3A60D42D
7800 0 CC00 01B4    BEGIN LDD  L  LINKH       SET UP RESTART TD            3A600430
7802 0 DC00 0004          STD  L  4             HIGH CORE ADJUST           3A6D0440
7804 0 3001               WAIT    1           WAIT FOR SWITCH SETTING      3A6D0450
7805 0 085C               XIO     RDSWS       READ SWITCHES                3A6D046D
7806 0 C06A               LD      SWS                                      3A600470
7807 0 1801               SRA     1                                        3A600480
7808 0 4C04 0160          BSC  L  STRTH,E     BR TO HIGH CORE ADJUST       3A600490
                    *                         IF SWT 14 ON.              3A600500
780A 0 C855               LDD     LINK        SET UP RESTART TD            3A600510
780B 0 DC00 0004          STD  L  4             LOW CORE ADJUST            3A6D0520
                    *                                                      3A600530
                    ************************************************       3A600540
                    *                                                      3A600550
                    *             LDW CORE ADJUST RDUTINE                  3A600560
                    *                                                      3A600570
                    ************************************************       3A600580
                    *                                                      3A600590
                    *                   DETERMINE SIZE OF CORE             3A6DD600
780D 0 6104         START LDX   1 4                                        3A600610
780E 0 1010               SLA     16                                       3A60062D
780F 0 D400 0000          STO  L  0                                        3A600630
7811 0 D400 6000          STO  L  /6000       CLEAR LOC 6000 OR 4000       3A600640
7813 0 C051               LD      K0800       CONSTANT                     3A600650
7814 0 1001         L031  SLA     1                                        3A600660
7815 0 D056               STD     SIZE                                     3A600670
7816 0 D480 786C          STD  I  SIZE                                     3A600680
7818 0 7400 0000          MDX  L  0,0                                      3A600690
```



```
781A 0 7002               MDX     LD32                                     3A600700
781B 0 71FF               MDX  1 -1                                        3A600710
781C 0 70F7               MDX     LD31                                     3A600720
781D 0 71FF         LD32  MDX  1 -1           WILL SKIP IF 24 OR 32K       3A600730
781E 0 7004               MDX     *+4         4, 8, OR 16K FOUND           3A600740
781F 0 7400 6000          MDX  L  /6000,0     WILL SKIP IF 32K             3A600750
7821 0 C042               LD      K6000       FETCH 24K SIZE CDNSTANT      3A600760
7822 0 D049               STO     SIZE        SET PROPER SIZE              3A600770
7823 D C04E               LD      H6004                                    3A600780
7824 0 0400 0000          STO  L  0                                        3A60D790
                    *                                                      3A600800
                    *                   ADJUST CORE SIZE AND               3A600810
                    *                   * CONSTANTS                        3A600820
                    *                                                      3A600830
7826 0 74FF 786C          MDX  L  SIZE,-1                                  3A600840
7828 0 1000               NOP                                              3A600850
7829 0 CD3D               LD      LLIM2       ADJUST CDNSTANT              3A600860
782A D ED41               AND     SIZE                                     3A600870
782B 0 D03B               STO     LLIM2                                    3A600880
782C 0 C042               LD      ULIM1                                    3A600890
782D 0 E03E               AND     SIZE                                     3A600900
782E 0 0040               STO     ULIM1                                    3A600910
                    *                   FIND LOOP CONTROLS                 3A600920
782F 0 CD3F               LD      ULIM1                                    3A600930
7830 D 9035               S       LLIM1                                    3A600940
7831 D DD36               STD     LOWRL                                    3A600950
7832 0 C039               LD      SIZE                                     3A600960
7833 0 9D33               S       LLIM2                                    3A600970
7834 0 9034               S       ONE                                      3A600980
7835 0 003A               STO     UPERL       UPPER LIMIT CDNTROL          3A600990
                    *                                                      3A601000
7836 D D828               XID     RDSWS       READ SWITCHES                3A601010
7837 0 C039               LD      SWS                                      3A601020
7838 0 4C04 783D          BSC  L  PAT02,E     BR IF SW 15 ON               3A601030
                    *                                                      3A601040
                    *                   SET UP BCP DR COMPL. BCP           3A601050
                    *                                                      3A601060
783A D 61DD         PAT01 LDX   1 D                                        3A601070
783B 0 62FF               LDX   2 -1                                       3A601080
783C 0 7002               MDX     PAT02+2                                  3A601090
783D D 61FF         PAT02 LDX   1 -1                                       3A601100
783E 0 6200               LDX   2 0                                        3A601110
783F 0 C026               LD      LL1M1       SET UP TO START AT           3A601120
784D 0 DD2A               STD     PLOC        * 1ST LOWER LIMIT            3A601130
7841 0 6780 7868          LDX   I3 LDWRL      SET UP LOOP CDNTROL          3A601140
7843 0 4D08               BSI     BCP         SET CORES                    3A601150
7844 0 C022               LD      LL1M2       SET UP TO START AT           3A601160
7845 0 D025               STO     PLOC        * 2ND LOWER LIMIT            3A601170
7846 0 6780 7B70          LDX   I3 UPERL      SET UP LDOP CONTRDL          3A601180
7848 0 4003               BSI     BCP         SET CORES                    3A601190
                    *                                                      3A501200
7849 0 3002         WAIT2 WAIT    2           END OF PRDGRAM               3A601210
784A 0 4CD0 780D          BSC  L  START                                    3A601220
                    *                                                      3A601230
                    *                                                      3A601240
                    *                   BCP AND COMPL. BCP  SU8RT          3A601250
                    *                                                      3A601260
784C 0 0000         BCP   DC      0                                        3A601270
784D 0 C01D               LD      PLOC        EXCUSIVE OR 8ITS 7           3A601280
784E 0 1806               SRA     6           * AND 9                      3A601290
784F 0 D01D               STO     TEMP                                     3A601300
7850 0 1802               SRA     2                                        3A601310
7851 0 F01B               EOR     TEMP                                     3A601320
7852 0 4C04 7B57          BSC  L  ODD,E                                    3A601330
7854 0 6D80 786B          STX   I1 PLOC                                    3A601340
7856 0 7002               MDX     ODD&2                                    3A601350
7857 0 6E80 786B    ODD   STX   I2 PLOC                                    3A601360
7859 0 7401 786B          MDX  L  PLOC,1      INCREMENT ADDRESS            3A601370
```

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785B 0 1000              SLA    0                                  3A601380
785C 0 73FF              MOX    3 -1        CK FOR ENO OF LOOP     3A601390
785O 0 70EF              MDX    BCP&1       REPEAT                 3A601400
785E 0 4C80 784C         BSC  I BCP         EXIT                   3A601410
                    *                                             3A601420
7860   0000              BSS  E 0                                  3A601430
7860 0 4C00 780D  LINK   BSC  L START       RESTART LINKAGE        3A601440
7862 0 7871       RDSWS  OC     SWS                                3A601450
7863 0 3A00              DC     /3A00       READ SWITCHES          3A601460
7864 0 6000       K6000  OC     /6000       24K CONSTANT           3A601470
7865 0 0800       K0800  OC     /0800       CONSTANT               3A601480
7866 0 0006       LLIM1  OC     /0006                              3A601490
7867 0 7873       LLIM2  DC     FIN         2NO LOWER LIMIT        3A601500
7868 0 0000       LOWRL  OC     0           LOWER LOOP CONTROL     3A601510
7869 0 0001       ONE    DC     1           CONSTANT 1             3A601520
786A 0 0000       PATNO  OC     0           PATTERN NUMBER         3A601530
786B 0 0000       PLOC   DC     0           PRESENT LOC            3A601540
786C 0 0000       SIZE   OC     0           CONTAINS CORE SIZE     3A601550
786O 0 0000       TEMP   DC     0                                  3A601560
786E 0 0002       TWO    OC     2           CONSTANT 2             3A601570
786F 0 780O       ULIM1  DC     START       1ST UPPER LIMIT        3A601580
7870 0 0000       UPERL  OC     0           UPPER LOOP CONTROL     3A601590
7871 0 0000       SWS    DC     0                                  3A601600
7872 0 6004       H6004  OC     /6004                              3A601610
7873 0 0000       FIN    DC     0           LAST LOC OF PROG       3A601620
                    *                                             3A601630
                    *                                             3A601640
7874                    ORG    /0160                              3A601650
                    ***************************************************3A601660
                    *                                             3A601670
                    *          HIGH CORE ADJUST ROUTINE           3A601680
                    *                                             3A601690
                    ***************************************************3A601700
                    *                                             3A601710
                    *               OETERMINE SIZE OF CORE        3A601720
0160 0 6104       STRTH LOX    1 4                                3A601730
0161 0 1010             SLA    16                                 3A601740
0162 0 O400 0000        STO  L 0                                  3A601750
0164 0 0400 6000        STO  L /6000       CLEAR LOC 6000 OR 4000 3A601760
0166 0 C052             LO     K080H       CONSTANT               3A601770
0167 0 I001       L031H SLA    1                                  3A601780
0168 0 D057             STO    SIZEH                              3A601790
0169 0 D480 01C0        STO  I SIZEH                              3A601800
016B 0 7400 0000        MOX  L 0,0                                3A601810
016O 0 7002             MOX    LD32H                              3A601820
016E 0 71FF             MOX    1 -1                               3A601830
016F 0 70F7             MDX    L031H                              3A601840
0170 0 71FF       L032H MDX    1 -1        WILL SKIP IF 24 OR 32K 3A601850
0171 0 7004             MOX    *+4         4, 8, OR 16K FOUNO     3A601860
0172 0 7400 6000        MOX  L /6000,0     WILL SKIP IF 32K       3A601870
0174 0 C043             LD     K600H       FETCH 24K SIZE CONSTANT3A601880
0175 0 004A             STO    SIZEH       SET PROPER SIZE        3A601890
0176 0 C04F             LO     H604H                              3A601900
0177 0 0400 0000        STO  L 0                                  3A601910
                    *                                             3A601920
                    *                AOJUST CORE SIZE ANO         3A601930
                    *                * CONSTANTS                  3A601940
                    *                                             3A601950
0179 0 74FF 01C0        MOX  L SIZEH,-1                           3A601960
0178 0 1000             NOP                                       3A601970
017C 0 C03E             LO     LIM2H       AOJUST CONSTANT        3A601980
017D 0 E042             AND    SIZEH                              3A601990
017E 0 003C             STO    LIM2H                              3A602000
017F 0 C043             LO     ULM1H                              3A602010
0180 0 E03F             AND    SIZEH                              3A602020
0181 0 D041             STO    ULM1H                              3A602030
                    *             FINO LOOP CONTROLS              3A602040
0182 0 C040             LD     ULM1H                              3A602050
```



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0183 0 9036              S      LIM1H                              3A602060
0184 0 0037              STO    LWRLH                              3A602070
0185 0 C03A              LO     SIZEH                              3A602080
0186 0 9034              S      LIM2H                              3A602090
0187 0 9035              S      ONEH                               3A602100
0188 0 003B              STO    UPRLH       UPPER LIMIT CONTROL    3A602110
                    *                                             3A602120
0189 0 082C              XIO    RDSWH       READ SWITCHES          3A602130
018A 0 C03A              LO     SWSH                               3A602140
018B 0 4C04 0190         BSC  L PAT2H,E     BR IF SW 15 ON         3A602150
                    *                                             3A602160
                    *              SET UP 8CP OR COMPL. BCP       3A602170
                    *                                             3A602180
0180 0 6100       PAT1H LOX    1 0                                3A602190
018E 0 62FF             LOX    2 -1                               3A602200
018F 0 7002             MDX    PAT2H+2                            3A602210
0190 0 61FF       PAT2H LDX    1 -1                               3A602220
0191 0 6200             LDX    2 0                                3A602230
0192 0 C027             LO     LIM1H                              3A602240
0193 0 0028             STO    PLOCH       * 1ST LOWER LIMIT      3A602250
0194 0 6780 018C        LDX  I3 LWRLH       SET UP LOOP CONTROL    3A602260
0196 0 400B             BSI    BCPH        SET CORES              3A602270
0197 0 C023             LD     LIM2H       SET UP TO START AT     3A602280
0198 0 0026             STO    PLOCH       * 2ND LOWER LIMIT      3A602290
0199 0 6780 01C4        LOX  I3 UPRLH       SET UP LOOP CONTROL    3A602300
0198 0 4003             BSI    8CPH        SET CORES              3A602310
                    *                                             3A602320
019C 0 3003       WAIT3 WAIT   3           ENO OF PROGRAM         3A602330
0190 0 4C00 0160        BSC  L STRTH                              3A602340
                    *                                             3A602350
                    *                                             3A602360
                    *          BCP ANO COMPL. 8CP  SUBRT          3A602370
                    *                                             3A602380
019F 0 0000       8CPH   DC     0                                  3A602390
01A0 0 C01E             LD     PLOCH       EXCLUSIVE OR BITS 7    3A602400
01A1 0 1B06             SRA    6           * AND 9                3A602410
01A2 0 001E             STO    TEMPH                              3A602420
01A3 0 1B02             SRA    2                                  3A602430
01A4 0 F01C             EOR    TEMPH                              3A602440
01A5 0 4C04 01AA        BSC  L OOOH,E                             3A602450
01A7 0 6080 01BF        STX  I1 PLOCH                             3A602460
01A9 0 7002             MOX    ODDH+2                             3A602470
01AA 0 6E80 01BF  OODH  STX  I2 PLOCH                             3A602480
01AC 0 7401 01BF        MDX  L PLOCH,1     INCREMENT ADDRESS      3A602490
01AE 0 1000             SLA    0                                  3A602500
01AF 0 73FF             MOX    3 -1        CK FOR ENO OF LOOP     3A602510
01B0 0 70EF             MDX    BCPH+1      REPEAT                 3A602520
01B1 0 4C80 019F        BSC  I BCPH        EXIT                   3A602530
                    *                                             3A602540
01B4   0000             BSS  E 0                                  3A602550
01B4 0 4C00 0160  LINKH BSC  L STRTH       RESTART LINKAGE        3A602560
01B6 0 01C5       RDSWH OC     SWSH                               3A602570
01B7 0 3A00             DC     /3A00       READ SWITCHES          3A602580
01B8 0 6000       K600H OC     /6000       24K CONSTANT           3A602590
01B9 0 0800       K080H DC     /0800       CONSTANT               3A602600
01BA 0 0006       LIM1H OC     /0006                              3A602610
01BB 0 01C7       LIM2H OC     FINH        2NO LOWER LIMIT        3A602620
01BC 0 0000       LWRLH DC     0           LOWER LOOP CONTROL     3A602630
01B0 0 0001       ONEH  DC     1           CONSTANT 1             3A602640
01BE 0 0000       PATNH DC     0           PATTERN NUMBER         3A602650
01BF 0 0000       PLOCH DC     0           PRESENT LOC            3A602660
01C0 0 0000       SIZEH DC     0           CONTAINS CORE SIZE     3A602670
01C1 0 0000       TEMPH DC     0                                  3A602680
01C2 0 0002       TWOH  OC     2           CONSTANT 2             3A602690
01C3 0 0160       ULM1H OC     STRTH       1ST UPPER LIMIT        3A602700
01C4 0 0000       UPRLH OC     0           UPPER LOOP CONTROL     3A602710
01C5 0 0000       SWSH  OC     0                                  3A602720
01C6 0 6004       H604H DC     /6004                              3A602730
```

```
01C7 0 0000          FINH  0C      0          LAST LOC OF PROG          3A602740
01C8   7800                END     8EGIN                                3A602750
 NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY
```


C R O S S R E F E R E N C E

NAME	VALUE	REFERENCES
8CP	784C	7843,7848,7850,785E
BCPH	019F	0196,0198,01B0,01B1
8EGIN	7800	01C8
FIN	7873	7867
FINH	01C7	01B8
H6004	7872	7823
H604H	01C6	0176
K080H	01B9	0166
K0800	7865	7813
K600H	01B8	0174
K6000	7864	7821
L031	7814	781C
L031H	0167	016F
LD32	7810	781A
L032H	0170	016D
L1M1H	01BA	0183,0192
L1M2H	01B8	017C,017E,0186,0197
LINK	7860	780A
LINKH	01B4	7800
LLIM1	7866	7830,783F
LLIM2	7867	7829,7828,7833,7844
LOWRL	7868	7831,7841
LWRLH	01BC	0184,0194
ODO	7857	7852,7856
OOOH	01AA	01A5,01A9
ONE	7869	7834
ONEH	01BD	0187
PATNH	01BE	
PATNO	786A	
PAT01	783A	
PAT02	783D	7838,783C
PAT1H	018D	
PAT2H	0190	0188,018F
PLOC	7868	7840,7845,7840,7854,7857,7859
PLOCH	018F	0193,0198,01A0,01A7,01AA,01AC
ROSWH	01B6	0189
RDSWS	7862	7805,7836
SIZE	786C	7815,7816,7822,7826,782A,782D,7832
SIZEH	01C0	0168,0169,0175,0179,0170,0180,0185
START	780D	784A,7860,786F
STRTH	0160	0190,01B4,01C3,7808
SWS	7871	7806,7837,7862
SWSH	01C5	018A,0186
TEMP	786D	784F,7851
TEMPH	01C1	01A2,01A4
TWO	786E	
TWOH	01C2	
ULIM1	786F	782C,782E,782F
ULM1H	01C3	017F,0181,0182
UPERL	7870	7835,7846
UPRLH	01C4	0188,0199
WAIT2	7849	
WAIT3	019C	

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1. PURPOSE

THE 113D INTERRUPT TEST PROGRAM IS DESIGNEO TO ISOLATE INTERRUPT FAILURES WHICH COULO PREVENT THE LOADING OF OTHER PROGRAMS WITH THE BASIC DIAGNOSTIC LOADER IN THE 'LOAO AND GO MODE.' THE PROGRAM EXECUTES 2 BASIC TESTS OR AN AUTOMATIC LEVEL RESET LOOP FOR SCOPING THE CAUSE OF A LEVEL NOT BEING RESET. TEST 1 IS RUN ON ALL DEVICES AND CHECKS THE BASIC OPERATION OF THE INTERRUPT FORCED BRANCH, THE PROPER EXECUTION OF A LEVEL 4 INTERRUPT, AND ISOLATES INTERRUPT LEVELS WHICH ARE NOT BEING RESET.

TEST 2 IS RUN ON THE 1442 READER AND CHECKS THE PROPER EXECUTION OF A LEVEL 4 INTERRUPT IN CONJUNCTION WITH A LEVEL 0 INTERRUPT, THE ARRIVAL OF AN END OP EITHER TOO SOON OR TOO LATE IN CONJUNCTION WITH THE COLUMN INTERRUPT, AND PROPER EXECUTION OF A LEVEL 0 INTERRUPT.
BOTH TESTS PROVIDE ERROR WAITS, ERROR LOOPS, AND SCOPE LOOP ROUTINES TO HELP DIAGNOSE THE FAILURE AND AID IN A QUICK REPAIR.

THE AUTOMATIC LEVEL RESET LOOP MODE IS FOR SCOPING THE RESET PROBLEM AND A WAIT INOICATE THE RESETTING OF THE INTERRUPT, IF IT OCCURS.

2. PREREQUISITES

2.1 PROGRAM PREREQUISITES

1130 BASIC DIAGNOSTIC LOADER.

2.2 EQUIPMENT PREREQUISITES

CARD READER OR PAPER TAPE READER.

3. OPERATING PROCEDURES

3.1 PROGRAM LOADING

1. THE 113D INTERRUPT TEST IS LOADED BY THE 113D BASIC DIAGNOSTIC LOADER.

2. SET THE C. E. INTERRUPT DELAY SWITCH TO THE 'ON' POSITION.

3. SEE BASIC OIAGNOSTIC LOADER DOCUMENTATION FOR LOADING PROCEDURE.

3.2 PROGRAM OPERATION

1. AFTER THE PROGRAM IS LOAOED, A WAIT OF WILL OCCUR. AT THIS TIME, THE I/O DEVICE BY WHICH THE PROGRAM WAS LOADED, AND THE PROGRAM MOOE ARE TO BE SELECTED VIA THE BIT SWITCHES. SEE TABLE A, WAIT 1.

THE REASON THE DEVICE WHICH LOADED THE PROGRAM MUST BE SELECTED, IS THAT WITH THE C.E. INTERRUPT DELAY SWITCH IN THE ON POSITIUN, THE BASIC LOADER GENERATES A LEVEL 4 INTERRUPT WHICH CAN NOT BE SERVICED. WHEN THE C.E. INTERRUPT DELAY SWITCH IS TURNED OFF, THE LEVEL 4 INTERRUPT MUST BE SERVICEC BEFORE ANY OTHER INTERRUPT CAN BE EXECUTEO.

2. IF THE PROGRAM DETECTS NO ERRORS, AND THE AUTOMATIC LOOP RESET MOOE IS NOT SELECTED, THE PROGRAM WILL HALT AT WAIT 4. IF A RERUN OF THE PROGRAM IS DESIRED, DEPRESS START.

3. ALL OTHER WAITS AND LOOPS ARE EXPLAINED IN TABLES A, B, AND C OF 3.3.

4. TO GO INTO A SCOPE LOOP AFTER A FAILURE HAS BEEN DETECTED. OEPRESS START. THE SCOPE LOOP IS SET UP FOR A 2 FEED/CYCLE PER SECONO RATE, AND A WAIT AFTER 1DD FEED CYCLES HAVE BEEN EXECUTED. THE C.E. HAS AN OPTION TO CHANGE THESE VALVES. (SEE 3.4)

3.3 WAITS AND LOOPS

1. TABLE A - TEST 1 WAITS AND SCOPE LOOPS -

WAIT D--OP CODE 00DD. NO TRANSFER TOOK PLACE FROM I/O BUSS TO B REG. LOGIC KM201.

WAIT F--'INITIAL' DEVICE SELECTION AND PROGRAM MODE SELECTION.

A. MAKE PROGRAM READ IN DEVICE READY.

B. SELECT PROGRAM READ IN DEVICE, USING BIT SWITCHES. 0, 1, OR 2 AS FOLLOWS,

1. BIT D-ON AND BITS 1 AND 2 OFF.. 1442 READER
2. BIT 1-ON AND BITS D AND 2 OFF.. P.T. READER
3. BIT 2-ON AND BITS D AND 1 OFF.. 2501 READER

C. IF AUTOMATIC RESET MODE IS DESIRED, SELECT LEVEL INVOLVED, USING BIT SWITCHES 4 THROUGH 7 AS FOLLOWS.

1. LEVEL 0-BIT 4
2. LEVEL 1-BIT 7
3. LEVEL 2-BIT 6
4. LEVEL 3-BITS 6 AND 7
5. LEVEL 4-BIT 5
6. LEVEL 5-BITS 5 AND 7
7. NO BITS SELECTED - LEVEL AUTOMATIC RESET MODE WAS NOT SELECTED.

D. DEPRESS START

WAIT 1--DEVICE SELECTION

A. MAKE DESIRED DEVICE READY.

B. SELECT DESIRED DEVICE, USING BIT SWITCHES 0, 1, OR 2 AS FOLLOWS. TURN OFF BIT SW B, IF ON.

1. BIT 0-ON AND BITS 1 AND 2 OFF.. 1442 READER
2. BIT 1-ON AND BITS 0 AND 2 OFF.. P.T. READER
3. BIT 2-ON AND BITS 0 AND 1 OFF.. 2501 READER

C. DEPRESS START

WAIT 2--DESIRED NUMBER OF FEED CYCLES DURING SCOPE LOOP, MAKE SURE THERE ARE ENOUGH CARDS OR TAPE TO MAKE ANOTHER PASS. PUSH START TO CONTINUE SCOPE LOOP.

WAIT 3--DEVICE WENT NOT READY. LOAD CARDS OR TAPE AND PUSH START TO CONTINUE.

WAIT 4--DEVICE TESTED, RAN SUCCESSFULLY. TO RERUN TEST, DEPRESS START.

WAIT 5--THE 1442 IS THE DEVICE SELECTED ON WHICH THE TEST WILL BE RUN. IF SOME OTHER DEVICE IS DESIRED, AND THIS IS NOT THE INITIAL WAIT 5, MAKE NEW SELECTION, USING CONSOLE ENTRY SWITCHES. (SEE WAIT 1) TURN INTERRUPT DELAY SW. OFF IF IT IS ON, AND DEPRESS START IF PROG. DOES NOT START OPERATION BECAUSE OF A PENDING INTERRUPT.

WAIT 6--PAPER TAPE IS THE DEVICE SELECTED ON WHICH THE TEST WILL BE RUN. IF SOME OTHER DEVICE IS DESIRED, AND THIS IS NOT THE INITIAL WAIT 6, MAKE NEW SELECTION, USING CONSOLE ENTRY SWITCHES. (SEE WAIT 1) TURN INTERRUPT DELAY SW OFF IF IT IS ON, AND DEPRESS START IF PROG DOES NOT START OPERATING BECAUSE OF A PENDING INTERRUPT.

WAIT 7--THE 2501 IS THE DEVICE SELECTED ON WHICH THE TEST WILL BE RUN. IF SOME OTHER DEVICE IS DESIRED, AND THIS IS NOT THE INITIAL WAIT 7, MAKE NEW SELECTION, USING CONSOLE ENTRY SWITCHES. (SEE WAIT 1) TURN INTERRUPT DELAY SW OFF IF IT IS ON, AND DEPRESS START IF PROG DOES NOT START OPERATING BECAUSE OF A PENDING INTERRUPT.

WAIT 8--NO DEVICE WAS SELECTED. MAKE SELECTION USING CONSOLE ENTRY SWITCHES. (SEE WAIT 1) DEPRESS START.

WAIT A--1442 WAS DEVICE SELECTED AND IT WAS FOUND NOT READY. MAKE 1442 READY, AND DEPRESS START.

WAIT B--PAPER TAPE READER WAS DEVICE SELECTED AND FOUND NOT READY. MAKE P.T. READER READY, AND DEPRESS START.

WAIT C--2501 WAS DEVICE SELECTED AND IT WAS FOUND NOT READY. MAKE 2501 READY, AND DEPRESS START.

WAIT 11-NO INTERRUPTS GENERATED. PROGRAM IS CHECKING ABILITY TO SET RUN TRIGGER WITH INTERRUPT OCCURRING DURING A WAIT OP. TO FURTHER CHECK RUN TRIGGER WITH PROGRAM, PUSH START.

WAIT 12-NO INTERRUPT GENERATED. RUN TRIGGER HAS BEEN ELIMINATED AS CAUSE OF FAILURE. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM321.

WAIT 13-DROPPED ADDR BIT 13 WHEN GATING INTERRUPT ADDRESS FROM I/O BUSS TO B REG DURING BSI I2 CYCLE. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 14-A LEVEL 1 INTERRUPT ADDRESS WAS GENERATED. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 15-A LEVEL 2 INTERRUPT ADDRESS WAS GENERATED. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 16-A LEVEL 3 INTERRUPT ADDRESS WAS GENERATED. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 17-PICK ADDR BIT 15 WHEN GATING INTERRUPT ADDR FROM I/O BUSS TO B REG DURING BSI I2 CYCLE. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 18-DROPPED ADDR BIT 12 WHEN GATING INTERRUPT ADDR FROM I/O BUSS TO B REG DURING BSI I2 CYCLE. TO GO INTO SCOPE LOOP PUSH START. LOGIC KM201.

WAIT 19-PICKED ADDR BIT 14 WHEN GATING INTERRUPT ADDR FROM I/O BUSS TO B REG OURING BSI I2 CYCLE. TO GO INTO SCOPE LOOP PUSH START. LOGIC KM201.

WAIT 1A-NO INTERRUPT ADDR BITS GATED FROM I/O BUSS TO B REG DURING BSI I2 CYCLE. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 1C-INTERRUPT OPERATION WAS NORMAL WHEN MASKING OUT WAIT OP. SUSPECT RUN TRIGGER IS NOT BEING SET. PUSHING START WILL CAUSE 1 FEED CYCLE EACH TIME IT IS PUSHED. LOGIC KA101.

LOOP LEVEL 0 ON-LEVEL 0 CANNOT BE RESET. AN AUTOMATIC SCOPE LOOP IS SET UP WITH THE PROG TRYING TO RESET IT. LOGIC KM201.

LOOP LEVEL 1 ON-LEVEL 1 CANNOT BE RESET. AN AUTOMATIC SCOPE LOOP IS SET UP WITH THE PROGRAM TRYING TO RESET IT. LOGIC KM201.

LOOP LEVEL 2 ON-LEVEL 2 CANNOT BE RESET. AN AUTOMATIC SCOPE LOOP IS SET UP WITH THE PROGRAM TRYING TO RESET IT. LOGIC KM201.

LOOP LEVEL 3 ON-LEVEL 3 CANNOT BE RESET. AN AUTOMATIC SCOPE LOOP IS SET UP WITH THE PROGRAM TRYING TO RESET IT. LOGIC KM201.

LOOP LEVEL 5 ON-LEVEL 5 CANNOT BE RESET. AN AUTOMATIC SCOPE LOOP IS SET UP WITH PROGRAM TRYING TO RESET IT. LOGIC KM201.

2. TABLE B - TEST 2 WAITS AND SCOPE LOOPS

WAIT 21-NO INTERRUPTS WERE GENERATED WITHIN 500 MSEC. AFTER A CARD IS FED. THIS SHOULD HAVE BEEN ENOUGH TIME TO RECEIVE 80 COLUMN INTERRUPTS AND AN END OF INTERRUPT. TO GO INTO SCOPE LOOP, PUSH START. IF AN INTERRUPT IS GENERATED DURING THE SCOPE LOOP, A WAIT WILL IDENTIFY IT LOGIC KM30

WAIT 22-NO LEVEL 4 INTERRUPT WAS GENERATED AFTER AT LEAST 1 COLUMN INTERRUPT WAS RECEIVED. THE ACTUAL NUMBER OF COLUMN INTERRUPTS IS DISPLAYED IN THE A REG. POSSIBLE CAUSE COULD BE LEVEL 0 NOT BEING RESET. TO GO INTO SCOPE LOOP, PUSH START LOGIC KM321.

WAIT 23-MORE THAN 80 COLUMN INTERRUPTS WERE RECEIVED WHEN END OP WAS GENERATED. THE ACTUAL NUMBER OF COLUMN INTERRUPTS IS DISPLAYED IN THE A REG. POSSIBLE CAUSE COULD BE DEVICE EMITTER. TO GO INTO SCOPE LOOP, PUSH START.

WAIT 24-LESS THAN 80 COLUMN INTERRUPTS WERE RECEIVED WHEN END OP WAS GENERATED. THE ACTUAL NUMBER OF COLUMN INTERRUPTS IS DISPLAYED IN THE A REG. POSSIBLE CAUSE COULD BE DEVICE EMITTER. TO GO INTO SCOPE LOOP, PUSH START.

WAIT 25-INTERRUPT GENERATED CAUSE A LEVEL 1 ADDRESS TO BE GENERATED. POSSIBLE CAUSE COULD BE THAT ADDRESS BIT 15 WAS PICKED WHEN TRANSFERRING INTERRUPT ADDRESS FROM I/O BUSS TO B REG DURING I2 CYCLE OF A LEVEL 0 INTERRUPT. COLUMN COUNT IS DISPLAYED IN A REG. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 26-INTERRUPT GENERATE CAUSE A LEVEL 2 ADDRESS TO BE GENERATE POSSIBLE CAUSE COULD BE THAT ADDRESS BIT 14 WAS PICKED WHEN TRANSFERRING INTERRUPT ADDRESS FROM I/O BUSS TO B REG DURING I2 CYCLE OF A LEVEL 0 INTERRUPT. COLUMN COUNT IS DISPLAYED IN A REG. TO GO INTO SCOP LOOP, PUSH START. LOGIC KM201.

WAIT 27-INTERRUPT GENERATED CAUSED A LEVEL 3 ADDRESS TO BE GENERATED. POSSIBLE CAUSE COULD BE THAT ADDRESS BITS 14 AND 15 WERE PICKED WHEN TRANSFERRING INTERRUPT ADDRESS FROM I/O BUSS TO B REG DURING I2 CYCLE OF A LEVEL 0 INTERRUPT. COLUMN COUNT IS DISPLAYED IN A REG. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 28-INTERRUPT GENERATED CAUSED A LEVEL 3 ADDRESS TO BE PICKED WHEN TRANSFERRING INTERRUPT ADDRESS FROM I/O BUSS TO B REG DURING I2 CYCLE OF A LEVEL 0 INTERRUPT. COLUMN COUNT IS DISPLAYED IN A REG. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

WAIT 29-BIT 12 WAS DROPPED WHEN TRANSFERRING INTERRUPT ADDRESS FROM I/O BUSS TO B REG DURING I2 CYCLE OF A LEVEL 0 INTERRUPT. COLUMN COUNT IS DISPLAYED IN A REG. TO GO IN SCOPE LOOP, PUSH START. LOGIC KM201

3. TABLE C - AUTOMATIC LOOP RESET MODE WAITS

WAIT 3F - AUTOMATIC LOOP RESET MODE SELECTED. TURN C.E. INTERRUP DELAY SWITCH OFF. THIS SHOULO CAUSE AN AUTOMATIC RESET LOOP FOR THE LEVEL SELECTED IN BIT SWITCHES 4 THROUGH 7 LOGIC KT311.

WAIT 30 - LEVEL 0 WAS SELECTED IN AUTOMATIC RESET LOOP MOOE. A RESET OF THIS LEVEL OID OCCUR. DEPRESS START TO GO TO WAIT 1.

WAIT 31 - LEVEL 1 WAS SELECTED IN AUTOMATIC RESET LOOP MOOE. A RESET OF THIS LEVEL DID OCCUR. DEPRESS START TO GO TO WAIT 1.

WAIT 32 - LEVEL 2 WAS SELECTED IN AUTOMATIC RESET LOOP MODE. A RESET OF THIS LEVEL OID OCCUR. OEPRESS START TO GO TO WAIT I.

WAIT 33 - LEVEL 3 WAS SELECTED IN AUTOMATIC RESET LOOP MODE. A RESET OF THIS LEVEL DIO OCCUR. DEPRESS START TO GO TO WAIT 1.

WAIT 34 - LEVEL 4 WAS SELECTED IN AUTOMATIC RESET LOOP MOOE. A RESET OF THIS LEVEL DID UCCUR. DEPRESS START TO GO TO WAIT 1.

WAIT 35 - LEVEL 5 WAS SELECTED IN AUTOMATIC RESET LOOP MODE. A RESET OF THIS LEVEL DID OCCUR. DEPRESS START TO GO TO WAIT 1.

3.4 C.E. SCOPE LOOP OPTIONS

1. THE FEED CYCLE RATE IS PROGRAMED FOR 2 CYCLE PER SECOND. THIS RATE CAN BE CHANGED BY THE C.E. THROUGH THE SETTING OF BIT SWITCHES 8, 9, IO, OR 11 AS FOLLOWS

    1. BIT SW.8 ON - 4 CYCLES PER SECOND.
    2. BIT SW.9 ON - 8 CYCLES PER SECOND.
    3. BIT SW10 ON - 16 CYCLES PER SECOND.
    4. BIT SW11 ON - MAX PROGRAMEO SPEED.
    5. NO SWS ON - 2 CYCLES PER SECONO.

    THESE SWITCHES MAY BE CHANGED AT ANY TIME OURING SCOPE LOOP.

2. THE NUMBER OF FEED CYCLES BETWEEN WAIT TWOS ARE PROGRAMEO FOR 100 THIS NUMBER CAN BE CHANGED BY THE C.E. THROUGH THE SETTING OF BIT SWITCHES 12, 13, 14, OR 15 AS FOLLOWS

    1. BIT 12 ON - 25000 FEEO CYCLES
    2. BIT 13 ON - 250 FEEO CYCLES
    3. BIT 14 ON - 50 FEED CYCLES
    4. BIT 15 ON - 10 FEED CYCLES
    5. NO BITS ON - 100 FEED CYCLES

    THE SWITCHES MAY BE CHANGED AT ANY TIME DURING THE SCOPE LOOP.

3. THE C.E. HAS THE OPTION TO TERMINATE THE SCOPE LOOP AND RETURN TO WAIT 1 FOR ANY NEW SET UP BY TURNING ON BIT SWITCH 03.

4. PRINTOUTS (NONE)

5. PROGRAM PHILOSOPHY

INTERRUPT TEST WILL BE RUN AFTER PROBLEMS ARE ENCOUNTERED WHEN TRYING TO LOAD A PROGRAM WITH THE BASIC LOADER IN THE LOAD AND GO MODE. THE CE INTERRUPT DELAY SWITCH IS THEN PLACED IN THE ON POSITION AND THE C.P.U. TEST IS THEN LOADED, AGAIN USING THE BASIC LOADER. THE SWITCH BEING ON, ALLOWS THE C.P.U. TEST TO BE LOADED WITHOUT THE INTERRUPT CIRCUITRY. IF THE C.P.U. TEST RUNS SUCCESSFULLY, THEN THE INTERRUPT CIRCUITRY WOULD BECOME THE PRIME AREA OF SUSPICION AS CAUSE OF THE LOADING PROBLEM. THE INTERRUPT TEST WOULD THEN BE RUN NEXT.

THE INTERRUPT TEST DOES NOT CHECK ON DATA TRANSFER, BUT DOES CHECK THE PROPER OPERATION OF THE INTERRUPT FORCED BRANCH INSTRUCTION AND THE PROPER LEVEL INTERRUPT ADDRESS. IN MOST CASES, AFTER THE TEST LOCATES THE PROBLEM AND IDENTIFIES IT WITH THE PROPER WAIT, A SCOPING LOOP CAN BE ENTERED BY DEPRESSING START. THE C.E. HAS 3 OPTIONS AT HIS CONTROL WHILE IN THE SCOPIN LOOP. THESE ARE

1. DELAY BETWEEN FEED CYCLES
2. NUMBER OF FEED CYCLES BETWEEN WAIT 2
3. AN OPTION TO SELECT ANOTHER DEVICE IF THERE IS ONE AVAILABLE

THE INTERRUPT TEST ALSO ALLOWS THE C.E. TO SELECT AN AUTOMATIC LEVEL RESET LOOP MODE. THIS OPTION IS TO BE USED WHEN A LEVEL CANNOT BE RESET. IF THIS WERE THE CASE, MOST OF THE PROGRAM'S TIME WOULD BE SPENT TRYING TO SERVICE THE INTERRUPT LEVEL AND PROGRAM OPERATION WOULD BE VERY ERRATIC. THEREFORE, THIS OPTION IS SET UP WITH A MINIMUM OF PROGRAM STEPS AFTER THE C.E. INTERRUPT DELAY SWITCH IS TURNED OFF. IF THE INTERRUPT LEVEL IS RESET, A WAIT WILL INDICATE SO.

THE INTERRUPT TEST AIDS IN LOCATING PROBLEMS IN 3 BASIC AREAS. THEY ARE

1. LEVEL 4 (END OP) OF THE READ IN DEVICES
2. LEVEL 0 (COLUMN) OF THE 1442
3. LEVELS WHICH CANNOT BE RESET

LEVEL 4 - AT THE END OF A FEED OPERATION, THIS INTERRUPT IS GENERATED. THE TEST TRAPS SUCH FAILURES AS NO INTERRUPT GENERATED DURING A WAIT OP, NO INTERRUPT GENERATED WHILE PROGRAM IS RUNNING, NO TRANSFER OF BSI L INSTRUCTI BITS OR INTERRUPT ADDRESS BITS FROM I/O BUSS TO B REG, DROPPING OR PICKING BITS BETWEEN I/O BUSS AND B REG, AND THE DETECTION OF AN INTERRUPT LEVEL NOT BEING RESET WHILE THIS TEST IS BEING RUN. ALL READ/IN DEVICES USE THIS PHAS OF THE TEST AND THE WAITS ARE IDENTIFIED BY WAIT 1X WHERE X IS THE PROBLEM IDENTIFIER.

LEVEL 0 - THE I442 IS THE ONLY READ/IN DEVICE USING THIS PHASE OF THE TEST. THE TEST TRAPS PROBLEMS AS NO INTERRUPT GENERATED, NO LEVEL 4 INTERRUPT GENERATED AFTER AT LEAST 1 LEVEL 0 INTERRUPT, PICKED OR DROPPED ADDRESS BITS ASSOCIATED WITH A LEVEL 0 INTERRUPT, LESS THAN 80 COLUMN INTERRUPTS BEFORE AN END OP, AND MORE THAN 80 COLUMNS BEFORE AN END OP. THE WAITS ASSOCIATED WITH THIS PHASE ARE-WAIT 2X, WHERE X IDENTIFIES THE PROBLEM.

AUTOMATIC LEVEL RESET LOOP - ALLOW SCOPING OF LEVELS WHICH CANNOT BE RESET. THIS MODE IS IDENTIFIED BY WAIT 3F. IF THE LEVEL IS RESET WHILE LOOPING, THE PROGRAM WILL WAIT. THE WAITS ASSOCIATED WITH THIS PHASE ARE-WAIT 3X, WHERE X IOENTIFIES THE LEVEL. DEPRESSING START WILL CAUSE THE PROGRAM TO GO WAIT 1, WHERE A NEW SETUP CAN BE MADE.

THE TEST IS DYNAMIC WHILE TESTING LEVEL 0 AND LEVEL 4 INTERRUPT OPERATION. IF AN INTERMITTENT FAILURE IS ENCOUNTERED, THE PROGRAM WILL INDICATE EACH FAILURE. IF THE TEST IS IN A SCOPE LOOP AND THE TROUBLE DISAPPEARS, THE PROGRAM AUTOMATICALLY RECOVERS AND TRIES TO COMPLETE A SUCCESSFUL RUN OR TRA ANY OTHER FAILURE THAT MIGHT DCCUR.

6. APPENDIX (NONE)

---------- LAST PAGE ----------

```
                        ABS
                        ORG     /500
0000                    OC      /03A8       PID
0500 0 03A8
0501 0 1000     8EGIN NOP
                *
0502 0 300F     WAITF WAIT    /F
                ********************************************
                *                                          *
                *                  WAIT F                  *
                *                                          *
                * IF PROGRAM IS 8EING RUN BECAUSE AN INTRPT *
                * INDICATOR IS NOT BEING CLEARED, SET COSOLE*
                * ENTRY SWITCHES 4---7 TO IOENTIFY LEVEL AT *
                * FAULT ANO SELECT OEVICE TO 8E USED IN TEST*
                * MAKE DEVICE READY ANO PUSH START.        *
                *                                          *
                * IF PROGRAM IS BEING RUN 8ECAUSE OF SOME  *
                * OTHER REASON THAN STATEO A8OVE,          *
                *    A. SELECT DEVICE VIA CONSOLE SWITCHES *
                *       0---2.                             *
                *    B. MAKE OEVICE REAOY.                 *
                *    C. PRESS START.                       *
                * NOTE INITIAL WAIT F , SELECT PROGRAM READ *
                * IN OEVICE                                *
                ********************************************
                *                                          *
                ********************************************
                * INTERRUPT VECTOR SETUP.                  *
                ********************************************
                *
0503 0 6500 0735 MAPIT LOX   L1 VEC00
0505 0 6000 0008       STX   L1 /0008      LEVEL 0
0507 0 6500 0745       LDX   L1 VEC01
0509 0 6000 0009       STX   L1 /0009      LEVEL 1
050B 0 6500 0755       LDX   L1 VEC02
0500 0 6D00 000A       STX   L1 /000A      LEVEL 2
050F 0 6500 0765       LOX   L1 VEC03
0511 0 6000 000B       STX   L1 /000B      LEVEL 3
0513 0 6500 0771       LDX   L1 VEC04
0515 0 6000 000C       STX   L1 /000C      LEVEL 4
0517 0 6500 07BC       LDX   L1 VEC05
0519 0 6D00 0000       STX   L1 /0000      LEVEL 5
051B 0 6500 07DC       LDX   L1 BAD12
0510 0 6000 0004       STX   L1 /0004      BIT 12 DROPPED
051F 0 6500 07E8       LOX   L1 8AD14
0521 0 6000 000E       STX   L1 /000E      8IT 14 PICKED
0523 0 6500 07F4       LDX   L1 NOAOR
0525 0 6000 0000       STX   L1 /0000      NO INTERRUPT ADDR
                *
0527 0 7001             MDX     WHICH
                *
0528 0 3001     WAIT1 WAIT    1
                ********************************************
                *                                          *
                *                  WAIT 1                  *
                *                                          *
                *    A. SELECT DEVICE VIA CONSOLE SWITCHES *
                *       0---2.                             *
                *    8. MAKE DEVICE READY.                 *
                *    C. PRESS START.                       *
                *                                          *
                ********************************************
                *
0529 0 6500 1000 WHICH LDX   L1 /1000
0528 0 69FB            STX    1 WAIT1-1
052C 0 0C00 0A68       XIO   L  BITSW      READ BIT SWITCHES
052E 0 C400 0A79       LD    L  BITS1      LOAD BIT SWITCHES
0530 0 180C            SRA      12         SET UP FOR DEVICE
```

```
3A800020
3A800030
3A800040
3A800050
3A800060
3A800070
3A800080
3A800090
3A800100
3A800110
3A800120
3A800130
3A800140
3A800150
3A800160
3A800170
3A800180
3A800190
3A800200
3A800210
3A800220
3A800230
3A800240
3A800250
3A800260
3A800270
3A800280
3A800290
3A800300
3A800310
3A800320
3A800330
3A800340
3A800350
3A800360
3A800370
3A800380
3A800390
3A800400
3A800410
3A800420
3A800430
3A800440
3A800450
3A800460
3A800470
3A800480
3A800490
3A800500
3A800510
3A800520
3A800530
3A800540
3A800550
3A800560
3A800570
3A800580
3A800590
3A800600
3A800610
3A800620
3A800630
3A800640
3A800650
3A800660
3A800670
3A800680
3A800690
```



```
0531 0 0400 0A7A        STO   L  BITS2
0533 0 1801             SRA      1
0534 0 4C04 05CC        BSC   L  WHAT3,E    CHECK FOR 2501
0536 0 1801             SRA      1
0537 0 4C04 05C2        BSC   L  WHAT2,E    CHECK FOR PAPER TAPE
0539 0 1801             SRA      1
053A 0 4C04 05B9        BSC   L  WHAT1,E    CHECK FOR 1442
                *
                ********************************************
                *                                          *
                *                  WAIT 8                  *
                *                                          *
                * NO DEVICE WAS FOUND TO BE SELECTEO.      *
                * MAKE SELECTION AND PRESS START.          *
                *                                          *
                ********************************************
                *
053C 0 3008     WAIT8 WAIT    8           NO DEVICE SELECTEO
0530 0 4C00 0529        BSC   L  WHICH    SET UP TO CHK AGAIN
                *
053F 0 0C00 0A68 CKLOP XIO   L  BITSW      READ 8IT SWITCHES
0541 0 C400 0A79       LD    L  BITS1      LOA0 8IT SWITCHES
0543 0 1808            SRA      8          LEVEL ON CHECK
0544 0 D400 0A78       STO   L  BITS3      LEVEL CHECK 8ITS
0546 0 1803            SRA      3          CHECK FOR LEVEL 0 ON
0547 0 4C04 0581       BSC   L  VECT0,E    SET UP LEVEL 0 LOOP
0549 0 C400 0A78       LD    L  BITS3      LEVEL CHECK BITS
0548 0 4C04 0579       BSC   L  CK8IT,E    NUM OF LEVEL IS OOD
0540 0 1801            SRA      1          CHECK FOR LEVEL 2 ON
054E 0 4C04 0591       8SC   L  VECT2,E    SET UP LEVEL 2 LOOP
0550 0 1801            SRA      1          CHECK FOR LEVEL 4 ON
0551 0 4C04 05A5       8SC   L  VECT4,E    SET UP LEVEL 4 LOOP
0553 0 4C00 06AF       BSC   L  CLRIX      NO RESET LOOP SEL.
                *
                ********************************************
                *                  WAIT 3F                 *
                * LEVEL RESET LOOP OPTION HAS BEEN CHOSEN.  *
                * TURN C.E. INTERRUPT SWITCH - OFF. THIS    *
                * SHOULD SET UP AN AUTOMATIC RESET LOOP FOR *
                * DEVICE ANO LEVEL SELECTEO,FOR SCOPE/WORK. *
                ********************************************
                *     RESTORE LEVEL RESET LOOP WAITS       *
                ********************************************
0555 0 6500 3030 GOLOP LDX   L1 /3030
0557 0 6000 073A       STX   L1 M0013      RESTORE WAIT 30
0559 0 6500 3031       LDX   L1 /3031
055B 0 6000 074A       STX   L1 MOD14      RESTORE WAIT 31
055D 0 6500 3032       LDX   L1 /3032
055F 0 6D00 075A       STX   L1 MOD15      RESTORE WAIT 32
0561 0 6500 3033       LDX   L1 /3033
0563 0 6D00 076A       STX   L1 MOD16      RESTORE WAIT 33
0565 0 6500 3035       LDX   L1 /3035
0567 0 6000 07C1       STX   L1 MOD17      RESTORE WAIT 35
                *
0569 0 C400 091F       LD    L  MOD12&1    SET UP WAIT 1 RETURN
0568 0 0400 0740       STO   L  MOD13&6
056D 0 D400 0750       STO   L  MOD14&6
056F 0 D400 0760       STO   L  MOD15&6
0571 0 D400 0770       STO   L  MOD16&6
0573 0 0400 07C7       STO   L  MOD17&6
                *
0575 0 303F     LOOPS WAIT    /3F
0576 0 4C00 0528       BSC   L  WAIT1      *-*
0578 0 70F0            MDX      LOOPS&1
                *
0579 0 1801     CKBIT SRA     1           CHECK FOR LEVEL 3 ON
057A 0 4C04 059B       8SC   L  VECT3,E    SET UP LEVEL 3 LOOP
057C 0 1801            SRA      1          CHECK FOR LEVEL 5
```

```
3A800700
3A800710
3A800720
3A800730
3A800740
3A800750
3A800760
3A800770
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3A801360
3A801370
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057D 0 4C04 05AF          BSC  L  VECT5,E     SET UP LEVEL 5 LOOP      3A801380
057F 0 4C00 0587          BSC  L  VECT1       SET UP LEVEL 1 LOOP      3A801390
                          *                                            3A801400
0581 0 6500 0732  VECTO   LDX  L1 LOOP0&1                              3A801410
0583 0 6D00 0577          STX  L1 LOOPS&2     SET LEV LOOP VECTOR      3A801420
0585 0 4C00 0555          BSC  L  GOLOP       SET UP,GO TO WAIT 3F     3A801430
                          *                                            3A801440
0587 0 6500 0742  VECT1   LDX  L1 LOOP1&1                              3A801450
0589 0 6D00 0577          STX  L1 LOOPS&2     SET LEV LOOP VECTOR      3A801460
058B 0 6500 0741          LDX  L1 LOOP1                                3A801470
058D 0 6D00 0009          STX  L1 /0009                                3A801480
058F 0 4C00 0555          BSC  L  GOLOP       SET UP,GO TO WAIT 3F     3A801490
                          *                                            3A801500
0591 0 6500 0752  VECT2   LDX  L1 LOOP2&1                              3A801510
0593 0 6D00 0577          STX  L1 LOOPS&2     SET LEV LOOP VECTOR      3A801520
0595 0 6500 0752          LDX  L1 LOOP2&1                              3A801530
0597 0 6000 000A          STX  L1 /000A                                3A801540
0599 0 4C00 0555          BSC  L  GOLOP       SET UP,GO TO WAIT 3F     3A801550
                          *                                            3A801560
059B 0 6500 0762  VECT3   LOX  L1 LOOP3&1                              3A801570
059D 0 6D00 0577          STX  L1 LOOPS&2     SET LEV LOOP VECTOR      3A801580
059F 0 6500 0761          LOX  L1 LOOP3                                3A801590
05A1 0 6D00 000B          STX  L1 /000B                                3A801600
05A3 0 4C00 0555          BSC  L  GOLOP       SET UP,GO TO WAIT 3F     3A801610
                          *                                            3A801620
05A5 0 6500 081F  VECT4   LDX  L1 LOOP4&1                              3A801630
05A7 0 6D00 0577          STX  L1 LOOPS&2     SET LEV LOOP VECTOR      3A801640
05A9 0 6500 081E          LDX  L1 LOOP4                                3A801650
05AB 0 6D00 000C          STX  L1 /000C                                3A801660
05AD 0 4C00 0555          8SC  L  GOLOP       SET UP,GO TO WAIT 3F     3A801670
                          *                                            3A801680
05AF 0 6500 07B9  VECT5   LOX  L1 LOOP5&1                              3A801690
0581 0 6D00 0577          STX  L1 LOOPS&2     SET LEV LOOP VECTOR      3A801700
05B3 0 6500 07B8          LDX  L1 LOOP5                                3A801710
05B5 0 6000 0000          STX  L1 /000D                                3A801720
05B7 0 4C00 0555          BSC  L  GOLOP       SET UP,GO TO WAIT 3F     3A801730
                          *                                            3A801740
05B9 0 0C00 0A5A  WHAT1   XIO  L  SENSE       SENSE 1442 READY         3A801750
05BB 0 4C04 05BF          BSC  L  NRDYA,E     CHK NOT READY            3A801760
05BD 0 4C00 05D5          BSC  L  SET42       SET UP 1442 PROG VEC     3A801770
                          ******************************************   3A801780
                          *                WAIT A                  *   3A801790
                          * 1442 SELECTED AND NOT READY. MAKE IT READY*  3A801800
                          * OR SOME OTHER DEVICE SELECTION VIA CONSOLE*  3A801810
                          * ENTRY SWITCHES. PUSH START.             *   3A801820
                          ******************************************   3A801830
05BF 0 300A       NRDYA   WAIT     /A         SEL 1442/NOT READY       3A801840
05C0 0 4C00 0529          8SC  L  WHICH       CHK DEVICE AGAIN         3A801850
                          *                                            3A801860
05C2 0 0C00 0A5C  WHAT2   XIO  L  SENPT       SENSE P.T. READY         3A801870
05C4 0 180A               SRA     10                                   3A801880
05C5 0 4C04 05C9          BSC  L  NRDYB,E     CHK NOT READY            3A801890
05C7 0 4C00 061F          BSC  L  SETPT       SET UP P.T. PROG VEC     3A801900
                          ******************************************   3A801910
                          *                WAIT B                  *   3A801920
                          * P.T. SELECTED AND NOT READY. MAKE IT READY*  3A801930
                          * OR SOME OTHER DEVICE SELECTION VIA CONSOLE*  3A801940
                          * ENTRY SWITCHES. PUSH START.             *   3A801950
                          ******************************************   3A801960
05C9 0 3008       NRDYB   WAIT     /B         SEL P.T./NOT READY       3A801970
05CA 0 4C00 0529          BSC  L  WHICH       CHK DEVICE AGAIN         3A801980
                          *                                            3A801990
05CC 0 0C00 0A5E  WHAT3   XIO  L  SEN25       SENSE 2501 READY         3A802000
05CE 0 4C04 0502          BSC  L  NROYC,E     CHK NOT READY            3A802010
05D0 0 4C00 0667          BSC  L  SET25       SET UP 2501 PROG VEC     3A802020
                          ******************************************   3A802030
                          *                WAIT C                  *   3A802040
                          * 2501 SELECTED AND NOT READY. MAKE IT READY*  3A802050
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                          * OR SOME OTHER DEVICE SELECTION VIA CONSOLE*  3A802060
                          * ENTRY SWITCHES. PUSH START.             *   3A802070
                          ******************************************   3A802080
05D2 0 300C       NROYC   WAIT     /C         SEL 2501/NOT READY       3A802090
05D3 0 4C00 0529          BSC  L  WHICH       CHK OEVICE AGAIN         3A802100
                          *                                            3A802110
05D5 0 6500 0A5A  SET42   LDX  L1 SENSE       SET UP 1442 SENSE WO     3A802120
05D7 0 6000 06DD          STX  L1 BUSY&1                               3A802130
0509 0 6000 06E8          STX  L1 TEST1&3                              3A802140
050B 0 6000 0728          STX  L1 WAITG&2                              3A802150
05DD 0 6000 0737          STX  L1 VEC00&2                              3A802160
05DF 0 6000 0747          STX  L1 VEC01&2                              3A802170
05E1 0 6000 0757          STX  L1 VEC02&2                              3A802180
05E3 0 6000 0767          STX  L1 VEC03&2                              3A802190
05E5 0 6000 0773          STX  L1 VEC04&2                              3A802200
05E7 0 6D00 07BE          STX  L1 VEC05&2                              3A802210
05E9 0 6000 07CA          STX  L1 CK00K&2                              3A802220
05EB 0 6000 07DE          STX  L1 8AD12&2                              3A802230
05E0 0 6000 07EA          STX  L1 BAD14&2                              3A802240
05EF 0 6000 07F6          STX  L1 NOAOR&2                              3A802250
05F1 0 6D00 0803          STX  L1 DSWCK&3                              3A802260
05F3 0 6000 080C          STX  L1 OSWCK&12                             3A802270
                          *                                            3A802280
05F5 0 6580 0A8E          LOX  I1 SRA01       SET UP 1442 BUSY CHK     3A802290
05F7 0 6000 06DE          STX  L1 8USY&2                               3A802300
                          *                                            3A802310
05F9 0 6580 0A80          LDX  I1 NOPIT       SET UP 1442 CONTROLS     3A802320
05FB 0 6D00 06EC          STX  L1 TEST1&4                              3A802330
05FD 0 6000 0804          STX  L1 DSWCK&4                              3A802340
05FF 0 6D00 0800          STX  L1 DSWCK&13                             3A802350
                          *                                            3A802360
0601 0 6500 0A6C          LDX  L1 FEED        SET UP 1442 XIO          3A802370
0603 0 6000 06F0          STX  L1 TEST1&8                              3A802380
                          *                                            3A802390
0605 0 6500 0A87          LOX  L1 K100        SET UP 1442 LOOP CNT     3A802400
0607 0 6000 06FF          STX  L1 NUM8R&1                              3A802410
0609 0 6D00 0724          STX  L1 NUMCK&1                              3A802420
                          *                                            3A802430
0608 0 6500 0AB4          LDX  L1 K010        SET UP 1442 GOOD CNT     3A802440
0600 0 6D00 07AA          STX  L1 FINSH&1                              3A802450
                          *                                            3A802460
060F 0 6500 082A          LDX  L1 SETUP       SET UP 1442 TEST VEC     3A802470
0611 0 6000 07AC          STX  L1 FINSH&3                              3A802480
                          *                                            3A802490
                          ******************************************   3A802500
                          *                                        *   3A802510
                          *                WAIT 5                  *   3A802520
                          *                                        *   3A802530
                          * 1442 WAS FOUNO READY AND WILL 8E THE    *   3A802540
                          * DEVICE USED IN THE TEST.                *   3A802550
                          * IF INTERRUPT DELAY SW ON, TURN OFF      *   3A802560
                          * IF PROGRAM OOES NOT START RUNNING BECAUSE *  3A802570
                          * OF A PENOING INTERRUPT, DEPRESS START.  *   3A802580
                          *                                        *   3A802590
                          ******************************************   3A802600
                          WAIT     5          1442 SELECTED            3A802610
0613 0 3005               XIO  L  8ITSW       READ BIT SWITCHES        3A802620
0614 0 0C00 0A68          LD   L  BITS1       LOAD BIT SWITCHES        3A802630
0616 0 C400 0A79          SRA      12                                  3A802640
0618 0 180C               S    L  8ITS2       LAST OEVICE SELECTED     3A802650
0619 0 9400 0A7A          8SC  L  CKLOP,&-    CHK FOR LEVEL LOOP       3A802660
061B 0 4C18 053F          BSC  L  WHICH       NEW DEVICE SELECTED      3A802670
0610 0 4C00 0529          *                                            3A802680
                          SETPT    LDX  L1 SENPT      SET UP PT SENSE WD  3A802690
061F 0 6500 0A5C          STX  L1 8USY&1                               3A802700
0621 0 6D00 060D          STX  L1 TEST1&3                              3A802710
0623 0 6D00 06EB          STX  L1 WAITG&2                              3A802720
0625 0 6D00 072B          STX  L1 VEC00&2                              3A802730
0627 0 6000 0737
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0629 0 6D00 0747          STX  L1 VEC01&2                                3A802740
0628 0 6D00 0757          STX  L1 VEC02&2                                3A802750
0620 0 6D00 0767          STX  L1 VEC03&2                                3A802760
062F 0 6D00 0773          STX  L1 VEC04&2                                3A802770
0631 0 6D00 078E          STX  L1 VEC05&2                                3A802780
0633 0 6D00 07CA          STX  L1 CK00K&2                                3A802790
0635 0 6000 07DE          STX  L1 8AD12&2                                3A802800
0637 0 6D00 07EA          STX  L1 BAD14&2                                3A802810
0639 0 6D00 07F6          STX  L1 NOA0R&2                                3A802820
0638 0 6D00 0803          STX  L1 DSWCK&3                                3A802830
063D 0 6D00 080C          STX  L1 DSWCK&12                               3A802840
                     *                                                   3A802850
063F 0 6580 0A90          LDX  I1 SRA11       SET UP P.T. 8USY CHK       3A802860
0641 0 6D00 06DE          STX  L1 8USY&2                                 3A802870
                     *                                                   3A802880
0643 0 6580 0A8F          LDX  I1 SRA10       SET UP P.T. ROY CHK        3A802890
0645 0 6D00 06EC          STX  L1 TEST1&4                                3A802900
0647 0 6D00 0804          STX  L1 DSWCK&4                                3A802910
0649 0 6D00 080D          STX  L1 DSWCK&13                               3A802920
                     *                                                   3A802930
0648 0 6500 0A74          LDX  L1 CNTRL       SET UP P.T. XIO            3A802940
0640 0 6D00 06F0          STX  L1 TEST1&8                                3A802950
                     *                                                   3A802960
064F 0 6500 0A87          LDX  L1 K100        SET UP P.T. CHAR CNT       3A802970
0651 0 6000 06FF          STX  L1 NUM8R&1                                3A802980
0653 0 6D00 0724          STX  L1 NUMCK&1                                3A802990
0655 0 6D00 07AA          STX  L1 FINSH&1                                3A803000
                     *                                                   3A803010
0657 0 6500 0913          LDX  L1 WAITA       SET UP P.T. TEST VEC       3A803020
0659 0 6D00 07AC          STX  L1 FINSH&3                                3A803030
                     *                                                   3A803040
                     ********************************************       3A803050
                     *                                          *       3A803060
                     *                WAIT 6                    *       3A803070
                     *                                          *       3A803080
                     * PAPER TAPE WAS FOUND READY AND WILL BE THE*       3A803090
                     * DEVICE USED IN THE TEST.                 *       3A803100
                     * IF INTERRUPT DELAY SW ON, TURN OFF       *       3A803110
                     * IF PROGRAM DOES NOT START RUNNING BECAUSE *       3A803120
                     * OF A PENDING INTERRUPT, DEPRESS START.   *       3A803130
                     *                                          *       3A803140
                     ********************************************       3A803150
065B 0 3006               WAIT    6           PAPER TAPE SELECTED        3A803160
065C 0 0C00 0A68          XIO  L  8ITSW       READ 8IT SWITCHES          3A803170
065E 0 C400 0A79          LD   L  8ITS1       LOAD 8IT SWITCHES          3A803180
0660 0 180C               SRA     12                                     3A803190
0661 0 9400 0A7A          S    L  8ITS2       LAST DEVICE SELECTED       3A803200
0663 0 4C18 053F          8SC  L  CKLOP,&-    CHK FOR LEVEL LOOP         3A803210
0665 0 4C00 0529          8SC  L  WHICH       NEW DEVICE SELECTED        3A803220
                     *                                                   3A803230
0667 0 6500 0A5E     SET25 LDX  L1 SEN25      SET UP 2501 SENSE WD       3A803240
0669 0 6D00 06DD          STX  L1 BUSY&1                                 3A803250
066B 0 6D00 06E8          STX  L1 TEST1&3                                3A803260
066D 0 6D00 0728          STX  L1 WAITG&2                                3A803270
066F 0 6D00 0737          STX  L1 VEC00&2                                3A803280
0671 0 6D00 0747          STX  L1 VEC01&2                                3A803290
0673 0 6D00 0757          STX  L1 VEC02&2                                3A803300
0675 0 6D00 0767          STX  L1 VEC03&2                                3A803310
0677 0 6D00 0773          STX  L1 VEC04&2                                3A803320
0679 0 6D00 078E          STX  L1 VEC05&2                                3A803330
067B 0 6000 07CA          STX  L1 CKDOK&2                                3A803340
0670 0 6D00 07DE          STX  L1 BAD12&2                                3A803350
067F 0 6000 07EA          STX  L1 8A014&2                                3A803360
0681 0 6D00 07F6          STX  L1 NOADR&2                                3A803370
0683 0 6000 0803          STX  L1 DSWCK&3                                3A803380
0685 0 6D00 080C          STX  L1 DSWCK&12                               3A803390
                     *                                                   3A803400
0687 0 6580 0A8E          LDX  I1 SRA01       SET UP 2501 BUSY CHK       3A803410
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0689 0 6D00 060E          STX  L1 8USY&2                                 3A803420
                     *                                                   3A803430
068B 0 6580 0A8D          LOX  I1 NOPIT       SET UP 2501 CONTROLS       3A803440
0680 0 6D00 06EC          STX  L1 TEST1&4                                3A803450
068F 0 6D00 0804          STX  L1 OSWCK&4                                3A803460
0691 0 6D00 080D          STX  L1 OSWCK&13                               3A803470
                     *                                                   3A803480
0693 0 6500 0A6E          LDX  L1 FEEDS       SET UP 2501 XIO            3A803490
0695 0 6000 06F0          STX  L1 TEST1&8                                3A803500
                     *                                                   3A803510
0697 0 6500 0A87          LDX  L1 K100        SET UP 2501 CARO CNT       3A803520
0699 0 6D00 06FF          STX  L1 NUMBR&1                                3A803530
069B 0 6D00 0724          STX  L1 NUMCK&1                                3A803540
069D 0 6000 07AA          STX  L1 FINSH&1                                3A803550
                     *                                                   3A803560
069F 0 6500 0913          LDX  L1 WAITA       SET UP 2501 TEST VEC       3A803570
06A1 0 6000 07AC          STX  L1 FINSH&3                                3A803580
                     *                                                   3A803590
                     ********************************************       3A803600
                     *                                          *       3A803610
                     *                WAIT 7                    *       3A803620
                     *                                          *       3A803630
                     * 2501 WAS FOUND READY AND WILL BE THE     *       3A803640
                     * DEVICE USED IN THE TEST.                 *       3A803650
                     * IF SOME OTHER DEVICE IS DESIRED, MAKE THAT*       3A803660
                     * DEVICE READY AND MAKE NEW DEVICE SELECTION*       3A803670
                     * VIA THE CONSOLE ENTRY SWITCHES.          *       3A803680
                     *                                          *       3A803690
                     ********************************************       3A803700
06A3 0 3007               WAIT    7           2501 SELECTED              3A803710
06A4 0 0C00 0A68          XIO  L  BITSW       READ 8IT SWITCHES          3A803720
06A6 0 C400 0A79          LD   L  BITS1       LOAD BIT SWITCHES          3A803730
06A8 0 180C               SRA     12                                     3A803740
06A9 0 9400 0A7A          S    L  BITS2       LAST DEVICE SELECTED       3A803750
06AB 0 4C18 053F          8SC  L  CKLOP,&-    CHK FOR LEVEL LOOP         3A803760
06AD 0 4C00 0529          8SC  L  WHICH       NEW DEVICE SELECTED        3A803770
                     *                                                   3A803780
06AF 0 6300          CLRIX LDX   3 0                                     3A803790
06B0 0 6200                LDX   2 0                                     3A803800
06B1 0 6100                LDX   1 0                                     3A803810
06B2 0 6500 0771           LDX  L1 VEC04                                 3A803820
06B4 0 6D00 000C           STX  L1 /000C                                 3A803830
06B6 0 C400 0728           LD   L  NUMCK&5     RESTORE LOOP CHK VEC      3A803840
06B8 0 D400 0740           STO  L  MOD13&6                               3A803850
06BA 0 D400 0750           STO  L  MOD14&6                               3A803860
06BC 0 D400 0760           STO  L  MOD15&6                               3A803870
06BE 0 D400 0770           STO  L  MOD16&6                               3A803880
06C0 0 D400 07C7           STO  L  MOD17&6                               3A803890
06C2 0 D400 07E7           STO  L  MOD18&6                               3A803900
06C4 0 D400 07F3           STO  L  MOD19&6                               3A803910
06C6 0 D400 07FF           STO  L  MOD1A&6                               3A803920
06C8 0 6500 3013           LDX  L1 /3013                                 3A803930
06CA 0 6D00 073A           STX  L1 MOD13       RESTORE WAIT 13           3A803940
06CC 0 6500 3014           LDX  L1 /3014                                 3A803950
06CE 0 6D00 074A           STX  L1 MOD14       RESTORE WAIT 14           3A803960
06D0 0 6500 3015           LOX  L1 /3015                                 3A803970
06D2 0 6D00 075A           STX  L1 M0015       RESTORE WAIT 15           3A803980
06D4 0 6500 3016           LOX  L1 /3016                                 3A803990
06D6 0 6D00 076A           STX  L1 MOD16       RESTORE WAIT 16           3A804000
06D8 0 6500 3017           LDX  L1 /3017                                 3A804010
06DA 0 6D00 07C1           STX  L1 MOD17       RESTORE WAIT 17           3A804020
                     *                                                   3A804030
06DC 0 0C00 0A5A     8USY  XIO  L  SENSE       SENSE DSW                 3A804040
06DE 0 1801                SRA     1           SET UP TO CHK BUSY        3A804050
06DF 0 4C04 06DC           BSC  L  8USY,E      CHECK FOR BUSY            3A804060
06E1 0 0C00 0A68           XIO  L  BITSW       SENSE 8IT SWITCHES        3A804070
06E3 0 C400 0A79           LD   L  BITS1       LOAD BIT SWITCHES         3A804080
06E5 0 180C                SRA     I2          CHK FOR WAIT 1 OPT        3A804090
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06E6 0 4C04 0772          8SC  L  VECD4&1,E   SET UP FOR RESTDRE          3A8D4100
                        *                                                  3A804110
06E8 0 6780 0A7F  TEST1 LDX  I3 DELAY         5DD MSEC DELAY              3A8D4120
06EA 0 0C00 DA5A        XIO  L  SENSE         SENSE FDR READY             3A80413D
06EC D 1000             NOP                                               3A804140
06ED 0 4C04 080D          8SC  L  DSWCK,E    CHECK FOR READY             3A804150
06EF 0 0C0D 0A6C          XIO  L  FEED        FEED                        3A8D416D
                        *                                                  3A8D4170
                        *                     *********************       3A8D418D
                        *                     *     WAIT 11       *       3A804190
                        *                     * NO INTERRUPTS     *       3ABD42D0
                        *                     * WERE GENERATED.   *       3A80421D
                        *                     * TO CKECK DUT RUN  *       3A8D422D
                        *                     * TRIGGER, PUSH     *       3A804230
                        *                     * START             *       3A8D4240
                        *                     *********************       3AB0425D
06F1 0 3011       RUNCK WAIT    /11           ND INTERRUPTS               3A8D4260
06F2 0 701A       MOD11 MDX     CKRUN         SET UP RUN TRIG CHK         3A80427D
06F3 0 73FF             MDX   3 -1           DECREMENT DELAY BY 1        3ABD4280
06F4 0 70FE             MDX     MDD11&1                                   3A804290
06F5 0 6100             LDX   1 0                                         3A804300
06F6 0 6D00 0A7C        STX   L1 GDCNT        RESET GDDD PASS CNTR        3AB04310
06F8 0 C400 0A7E        LD    L  LPCNT        LOAD LOOP CDUNT             3A8D4320
06FA 0 8400 0A81        A     L  A0001        ADD 1 TO LOOP COUNT         3A804330
06FC 0 0400 0A7E        STO   L  LPCNT        STORE LOOP COUNT            3A8D4340
06FE 0 9400 0A87  NUMBR S     L  K10D         CHK FOR STOP LOOP           3A804350
0700 0 4C10 0818          8SC  L  WAIT2,-                                 3A80436D
                        *                                                  3AB04370
                        *                     *********************       3A804380
                        *                     *     WAIT 12       *       3A80439D
                        *                     * ND INTERRUPTS     *       3A8044D0
                        *                     * WERE GENERATED.   *       3A804410
                        *                     * SETTING OF RUN    *       3A804420
                        *                     * TRIGGER APPEARS   *       3A804430
                        *                     * NOT TO 8E THE     *       3AB04440
                        *                     * CAUSE OF THE      *       3AB04450
                        *                     * FAILURE.          *       3A804460
                        *                     * TO GO INTO SCOPE  *       3A804470
                        *                     * LOOP, PUSH START.*        3A804480
                        *                     *********************       3A804490
0702 0 3012       RUNOK WAIT    /12           NO INT-RUN TRIG CKED        3A804500
0703 0 6500 0771        LDX   L1 VEC04                                    3A80451D
0705 0 6D00 000C        STX   L1 /000C        SET UP LEVEL 4 VEC          3A804520
0707 0 6500 1000        LDX   L1 /1000        NOP                         3A804530
0709 0 69E7             STX     1 RUNCK       SET UP SCOPE LOOP           3A804540
070A 0 69E7             STX     1 MOD11                                   3AB04550
070B 0 69F6             STX     1 RUNOK                                   3A804560
070C 0 7009             MDX     FDCYC         8RANCH TO SCOPE LOOP        3A804570
                        *                                                  3AB0458D
070D 0 6500 1000  CKRUN LDX   L1 /1000        SET UP RUN TRIG CHK         3A804590
070F 0 69E1             STX     1 RUNCK                                   3A804600
0710 0 69E1             STX     1 MOD11                                   3A804610
0711 0 6500 07C8        LDX   L1 CKDOK                                    3A804620
0713 0 6D00 000C        STX   L1 /0D0C                                    3A804630
0715 0 70C6             MDX     BUSY          CHECK RUN TRIGGER           3A804640
                        *                                                  3A804650
0716 0 6100       FDCYC LDX     1 0                                       3A804660
0717 0 6D00 0A7C        STX   L1 GDCNT        RESET GOOD PASS CNTR        3A804670
0719 0 4C00 0999          8SC  L  CNTCK       CHK COUNT OPTION            3A804680
                        *                                                  3A8D4690
071B 0 73FF       ERROR MDX   3 -1                                        3A8D4700
071C 0 70FE             MDX     ERROR         STEP DOWN DELAY             3A804710
071D 0 C400 0A7E        LD    L  LPCNT        LOAD LOOP COUNT             3A8D4720
071F 0 8400 0A83        A     L  K001         ADD 1 TO LOOP CNT           3A804730
0721 0 0400 0A7E        STO   L  LPCNT        STORE LOOP CNT              3A804740
0723 0 9400 0A87  NUMCK S     L  K100         CHECK FOR STOP LDDP         3A804750
0725 0 4C10 0729        BSC   L  WAITG,-      CHECK FOR WAIT 2            3A804760
0727 0 4C00 0716        BSC   L  FDCYC        FEED AGAIN                  3A804770
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                        *                                                  3A8D478D
                        ************************************************  3A804790
                        *                                              *  3A8D48D0
                        *                  WAIT 2                      *  3A8D4810
                        *                                              *  3A804820
                        * NORMAL WAIT AFTER DESIRED NUM8ER DF LDDPS    *  3AB04830
                        * PASSES HAVE BEEN MADE. PUSH START TD MAKE    *  3A8D4840
                        * ANDTHER LOOP CYCLE.                          *  3A804850
                        ************************************************  3A804860
                        *                                                  3A804870
D729 0 3002       WAITG WAIT    2             STDP SCOPE LDOP             3A8D4880
072A 0 0C00 DA5A        XIO   L  SENSE                                    3A804890
072C D 6100             LDX     1 D                                       3A804900
072D D 6D00 DA7E        STX   L1 LPCNT        RESET LDDP COUNT            3A8D4910
072F D 4C00 D716          BSC  L  FDCYC                                   3A80492D
                        *                                                  3A804930
0731 0 0000       LOOPO DC        D           *********************       3A804940
0732 0 DCD0 0A5C        XIO   L  SENPT        * LEVEL 0 AUTD      *       3A804950
0734 0 7001             MDX     VECOD&1       * LEVEL RESET LDDP  *       3A804960
                        *                     *********************       3A804970
0735 0 DDD0       VECDD DC        0           * LEVEL D RESET     *       3A804980
0736 D 0CD0 0A5A        XID   L  SENSE        * SCDPE LDDP        *       3A804990
0738 0 4C4D 073A          8OSC L  MDD13       *********************       3A805D00
                        *                                                  3A805010
                        *                     *********************       3A805020
                        *                     * INTERRUPT 0 LEVEL*        3A805030
                        *                     *     WAIT 30       *       3A805040
                        *                     * RESET OURING AUTO*        3A805050
                        *                     * SCOPE LOOP.       *       3A805060
                        *                     * PUSH START TO GD  *       3A805070
                        *                     * TO WAIT 1.        *       3A805080
                        *                     *********************       3A805090
                        *                     **********************      3A805100
                        *                     *     WAIT 13       *       3A805110
073A 0 3030       MOD13 WAIT    /30           * DROPPED ADDR BIT  *       3A805120
                        *                     * 13. PUSH START    *       3A805130
                        *                     * FOR SCOPE LOOP    *       3A805140
                        *                     **********************      3A805150
                          LDX   I1 MOFYB      MDX ERROR                   3A805160
073D 0 6D00 073A          STX   L1 MOD13                                  3A805170
073F 0 4CD0 0503          BSC   L  MAPIT                                  3A805180
                        *                     **********************      3A805190
0741 0 DD00       LOOP1 OC        0           *                    *      3A805200
0742 0 0C00 0A64        XIO   L  PRINT        * LEVEL 1 AUTO       *      3A805210
0744 0 7001             MDX     VEC01&1       * LEVEL RESET LOOP   *      3A8D5220
                        *                     **********************      3A805230
0745 0 D000       VECO1 OC        D           * LEVEL 1 RESET      *      3A805240
0746 0 0C00 0A5A        XIO   L  SENSE        * SCOPE LOOP         *      3A805250
0748 0 4C40 074A          BOSC L  MOD14       **********************      3A805260
                        *                                                  3A805270
                        *                     **********************      3A805280
                        *                     *     WAIT 31       *       3A80529D
                        *                     * INTERRUPT 1 LEVEL*        3A805300
                        *                     * RESET OURING AUTO*        3A80531D
                        *                     * SCOPE LOOP.       *       3A8D5320
                        *                     * PUSH START TD GO  *       3A805330
                        *                     * TO WAIT 1.        *       3A805340
                        *                     **********************      3A80535D
                        *                     **********************      3A805360
                        *                     *     WAIT 14       *       3A805370
074A D 3031       MOD14 WAIT    /31           * INTERRUPT CAUSED  *       3A805380
                        *                     * A LEVEL 1 ADDR TO*        3A805390
                        *                     * BE GENERATED.     *       3A805400
                        *                     * PUSH START FOR    *       3A805410
                        *                     * SCOPE LOOP.       *       3A805420
                        *                     **********************      3A805430
074B 0 6580 0A93          LDX   I1 MOFYC      MDX ERROR                   3A805440
074D D 6D00 074A          STX   L1 MOD14                                  3A805450
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074F 0 4C00 0503          8SC  L  MAPIT                          3A805460
                     *                                          3A805470
                     *                        ********************3A805480
                     *                        *     WAIT 32      *3A805490
                     *                        * INTERRUPT 2 LEVEL*3A805500
                     *                        * RESET DURING AUTD*3A805510
                     *                        * SCOPE LDOP.      *3A805520
                     *                        * PUSH START TD GO *3A805530
                     *                        * TO WAIT 1.       *3A805540
                     *                        ********************3A805550
0751 0 0000          LOOP2 OC       0          *                  *3A805560
0752 0 DC00 0A60           XIO  L   DISK       * LEVEL 2 AUTO     *3A805570
0754 0 7D01                MDX      VEC02&1    * LEVEL RESET LDOP *3A805580
                     *                        ********************3A805590
0755 0 0000          VEC02 DC       0          * LEVEL 2 RESET    *3A805600
0756 0 0C00 0A5A           XIO  L   SENSE      * SCOPE LOOP       *3A805610
0758 0 4C40 075A           BOSC L   MOD15      ********************3A805620
                     *                                          3A805630
                     *                        ********************3A805640
                     *                        *     WAIT 15      *3A805650
075A 0 3032          MOD15 WAIT     /32        * INTERRUPT CAUSED *3A805660
                     *                        * A LEVEL 2 ADDR TO*3A805670
                     *                        * 8E GENERATED.    *3A805680
                     *                        * PUSH START FDR   *3A805690
                     *                        * SCOPE LOOP.      *3A805700
                     *                        ********************3A805710
075B 0 6580 0A94           LDX  I1 MDFYD      MDX ERRDR          3A805720
0750 0 6D00 075A           STX  L1 MDD15                         3A805730
075F 0 4C00 0503           8SC  L  MAPIT                         3A805740
                     *                                          3A805750
                     *                        ********************3A805760
                     *                        *     WAIT 33      *3A805770
                     *                        * INTERRUPT 3 LEVEL*3A805780
                     *                        * RESET DURING AUTO*3A805790
                     *                        * SCOPE LOOP.      *3A805800
                     *                        * PUSH START TO GO *3A805810
                     *                        * TO WAIT 1.       *3A805820
                     *                        ********************3A805830
0761 0 000D          LOOP3 OC       0          *                  *3A805840
0762 0 0C00 0A62           XIO  L   PLOT       * LEVEL 3 AUTO     *3A805850
0764 0 7001                MDX      VEC03&1    * LEVEL RESET LOOP *3A805860
                     *                        ********************3A805870
0765 0 0000          VEC03 DC       0          * LEVEL 3 RESET    *3A805880
0766 0 0C00 0A5A           XIO  L   SENSE      * SCOPE LOOP       *3A805890
0768 0 4C40 076A           8OSC L   MOD16      ********************3A805900
                     *                                          3A805910
                     *                        ********************3A805920
                     *                        *     WAIT 16      *3A805930
076A 0 3033          MOD16 WAIT     /33        * INTERRUPT CAUSED *3A805940
                     *                        * A LEVEL 3 ADDR TD*3A805950
                     *                        * 8E GENERATED.    *3A8D5960
                     *                        * PUSH START FOR   *3A805970
                     *                        * SCOPE LOOP.      *3A805980
                     *                        ********************3A805990
0768 0 6580 0A95           LOX  I1 MDFYE      MOX ERRDR          3A806000
076D 0 6D00 076A           STX  L1 MDD16                         3A806010
076F 0 4C00 0503           8SC  L  MAPIT                         3A806020
                     *                                          3A806030
0771 0 0000          VEC04 DC       0                           3A806040
0772 0 0C00 0A5A           XID  L   SENSE                        3A806050
0774 0 6100                LOX   1 0                             3A806060
0775 0 6D00 0A7E           STX  L1 LPCNT      RESET LDOP COUNT   3A806070
0777 0 6580 0A9A           LDX  I1 MOFYL      MDX CKRUN          3A806080
0779 0 6D00 06F2           STX  L1 MOD11      RESTORE MOD11      3A806090
0778 0 6500 3011           LDX  L1 /3011                         3A806100
077D 0 6D00 06F1           STX  L1 RUNCK      RESTORE WAIT 11    3A806110
077F 0 6500 3012           LDX  L1 /3012                         3A806120
0781 0 6000 0702           STX  L1 RUNOK      RESTORE WAIT 12    3A806130
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0783 0 6500 3013          LDX  L1 /3013                         3A806140
0785 0 6D00 073A          STX  L1 MOD13      RESTORE WAIT 13    3A806150
0787 0 6500 3014          LDX  L1 /3014                         3A806160
0789 0 6D00 074A          STX  L1 MDD14      RESTORE WAIT 14    3A806170
0788 0 6500 3015          LDX  L1 /3015                         3A806180
078D 0 6D00 075A          STX  L1 MDD15      RESTORE WAIT 15    3A806190
078F 0 6500 3016          LDX  L1 /3016                         3A806200
0791 0 6D00 076A          STX  L1 MDD16      RESTDRE WAIT 16    3A806210
0793 0 6500 3017          LDX  L1 /3017                         3A806220
0795 0 6000 07C1          STX  L1 MOD17      RESTORE WAIT 17    3A806230
0797 0 6500 3018          LDX  L1 /3018                         3A806240
0799 0 6000 07E1          STX  L1 MOD18      RESTORE WAIT 18    3A806250
0798 0 6500 3019          LDX  L1 /3019                         3A806260
079D 0 6000 07ED          STX  L1 MDD19      RESTORE WAIT 19    3A806270
079F 0 6500 301A          LDX  L1 /301A                         3A806280
07A1 0 6D00 07F9          STX  L1 MOD1A      RESTORE WAIT 1A    3A806290
07A3 0 C400 0A7C          LD   L  GDCNT      RESET GODD COUNT   3A806300
07A5 0 8400 0A83          A    L  K001       ADO 1 TO GOOD COUNT3A806310
07A7 0 0400 0A7C          STO  L  GDCNT      STORE GOOD COUNT   3A806320
07A9 0 9400 0A84    FINSH S    L  K010       CHK FOR END TEST   3A806330
07A8 0 4C50 082A          8OSC L  SETUP,-    TEST 1 COMPLETE    3A806340
07AD 0 0C00 0A68          XID  L  8ITSW      SENSE 8IT SWITCHES 3A806350
07AF 0 C400 0A79          LD   L  8ITS1      LOAO 8IT SWITCHES  3A806360
07B1 0 180C               SRA       12       CHK FOR WAIT 1 OPT 3A806370
07B2 0 4C44 0914          8OSC L  WAITA&1,E  RESTORE/GO TO WAIT 1 3A806380
0784 0 4C40 06AF          8OSC L  CLRIX                         3A806390
                     *                                          3A806400
0786 0 4C00 071B    GAPIT 8SC  L  ERROR      ALLOW LOOP         3A806410
                     *                                          3A806420
0788 0 0000         LOOP5 DC       0          ********************3A806430
07B9 0 0C00 0A6A           XIO  L   STOP       * LEVEL 5 AUTO     *3A806440
07B8 0 7001                MDX      VEC05&1    * LEVEL RESET LOOP *3A806450
                     *                                          3A806460
07BC 0 0000         VEC05 OC       0                           3A806470
078D 0 0C00 0A5A           XID  L   SENSE        LEVEL 5 RESET  3A806480
078F 0 4C40 07C1           8OSC L   MOD17                        3A806490
                     *                        ********************3A806500
                     *                        *     WAIT 35      *3A806510
                     *                        * INTERRUPT 5 LEVEL*3A806520
                     *                        * RESET DURING AUTO*3A806530
                     *                        * SCOPE LOOP.      *3A806540
                     *                        * PUSH START TO GO *3A806550
                     *                        * TO WAIT 1.       *3A806560
                     *                        ********************3A806570
                     *                        ********************3A806580
                     *                        *     WAIT 17      *3A806590
07C1 0 3035         MOD17 WAIT     /35        * PICKED AODR BIT  *3A806600
                     *                        * 15. PUSH START   *3A806610
                     *                        * FOR SCOPE LOOP   *3A806620
                     *                        ********************3A806630
07C2 0 6580 0A96           LDX  I1 MOFYF      MDX ERROR          3A806640
07C4 0 6D00 07C1           STX  L1 MDD17                         3A806650
07C6 0 4C00 0503           8SC  L  MAPIT                         3A806660
                     *                                          3A806670
07C8 0 0000         CKDOK DC       0                           3A806680
07C9 0 0C00 0A5A           XIO  L   SENSE                        3A806690
07C8 0 4C40 07CD           8OSC L   WAITC                        3A806700
                     *                        ********************3A806710
07CD 0 301C         WAITC WAIT     /1C        *     WAIT 1C      *3A806720
                     *                        * RUN TRIGGER WILL *3A806730
                     *                        * NOT SET DURING A *3A806740
                     *                        * WAIT OPERATION   *3A806750
                     *                        ********************3A806760
07CE 0 6500 3011           LDX  L1 /3011      RESTDRE WAIT OP    3A806770
07D0 0 6D00 06F1           STX  L1 RUNCK                         3A806780
07D2 0 6580 0A91           LDX  I1 MOFYA      MDX BUSY           3A806790
07D4 0 6D00 06F2           STX  L1 MOD11      ALLOW ERROR TRAP   3A806800
07D6 0 6500 0771           LDX  L1 VEC04      RESTORE LEVEL 4    3A806810
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07D8 0 6D00 0D0C          STX  L1 /000C
07DA 0 4C40 06DC          BOSC L  BUSY       ERROR TRAP
                     *
07DC 0 0000          BAD12 DC      0
07DD 0 0C00 0A5A          XIO  L  SENSE      **********************
07DF 0 4C40 07E1          8OSC L  MOD18      *     WAIT 18        *
07E1 0 3018          MOD18 WAIT    /18        * DROPPED ADDR BIT  *
                     *                       * 12. PUSH START    *
                     *                       * FOR SCOPE LOOP    *
                     *                       **********************
07E2 0 6580 0A97          LDX  I1 MOFYG      MDX ERROR
07E4 0 6000 07E1          STX  L1 MOD18
07E6 0 4C00 0716          BSC  L  FDCYC      SCOPE LOOP
                     *
07E8 0 000D          BAD14 DC      0
07E9 0 0C0D 0A5A          XIO  L  SENSE      **********************
07EB 0 4C4D 07ED          8OSC L  MOD19      *     WAIT 19        *
07ED 0 3019          MOD19 WAIT    /19        * PICKED ADDR 8IT   *
                     *                       * 14. PUSH START    *
                     *                       * FOR SCOPE LOOP    *
                     *                       **********************
07EE 0 6580 0A98          LDX  I1 MOFYH      MDX ERROR
07F0 0 6D00 07ED          STX  L1 MOD19
07F2 0 4C00 0716          BSC  L  FDCYC      SCOPE LOOP
                     *
07F4 0 000D          NOADR DC      0
07F5 0 0C00 0A5A          XIO  L  SENSE      **********************
07F7 0 4C40 07F9          BOSC L  MDD1A      *     WAIT 1A        *
07F9 0 301A          MOD1A WAIT    /1A        * NO AODR TRANSFER  *
                     *                       * PUSH START FOR    *
                     *                       * SCOPE LOOP.       *
                     *                       **********************
07FA 0 6580 0A99          LDX  I1 MOFYJ      MDX ERROR
07FC 0 6D00 07F9          STX  L1 MOD1A
07FE 0 4C00 0716          8SC  L  FDCYC      SCOPE LOOP
                     *
                     *
                     ***********************************************
                     * OP/CODE 0, WAIT 0.-----NO READOUT OF BSI    *
                     * OR INTERRUPT ADDRESS.                       *
                     ***********************************************
                     *
                     *
0800 0 0400 0A80     DSWCK STO  L  OSW1       STORE DSW
0802 0 0C00 0A5A          XIO  L  SENSE      SENSE FOR READY
0804 0 1000               NOP
0805 0 9400 0A80          S    L  DSW1       SU8TRACT LAST OSW
0807 0 4C18 080B          BSC  L  DSWCK&11,&-
0809 0 4C00 06EA          8SC  L  TEST1&2    DSW CHANGED
080B 0 0C00 0A5A          XIO  L  SENSE      CHECK FOR READY
080D 0 1000               NOP
080E 0 6100               LOX   1 0
080F 0 6000 0A80          STX  L1 DSW1       RESET STORED DSW
0811 0 4C04 0815          BSC  L  WAIT3,E    NOT READY
0813 0 4C00 06EF          BSC  L  TEST1&7    READY
0815 0 3003          WAIT3 WAIT    3          **********************
                     *                       *     WAIT 3         *
                     *                       * READER NOT READY  *
                     *                       **********************
0816 0 4C00 06EA          BSC  L  TEST1&2    READER READY
                     *                       **********************
                     *                       *     WAIT 2         *
                     *                       * DESIREO NUMBER OF *
                     *                       * LOOP PASSES,WHILE *
                     *                       * IN SCOPE LOOP.    *
                     *                       * PUSH START TO     *
                     *                       * ANOTHER SCOPE     *
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3A8D6820
3A806830
3A806840
3A80685D
3A80686D
3A80687D
3A806880
3A806890
3A806900
3A80691D
3A80692D
3A806930
3A806940
3A8D6950
3A806960
3A80697D
3A806980
3A8D6990
3A8D7000
3A807010
3A807D20
3A807030
3A8D7040
3A807050
3A807060
3A807070
3A807080
3A807090
3A807100
3A807110
3A807120
3A807130
3A8D7140
3A8D7150
3A807160
3A80717D
3A807180
3A80719D
3A807200
3A807210
3A8D7220
3A807230
3A807240
3A807250
3A807260
3A807270
3A807280
3A807290
3A807300
3A807310
3A807320
3A80733D
3A807340
3A807350
3A807360
3A807370
3A807380
3A807390
3A807400
3A807410
3A807420
3A807430
3A807440
3A807450
3A807460
3A807470
3A807480
3A807490
```



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                     *                       * LOOP PASS.       *
                     *                       **********************
0818 0 3002          WAIT2 WAIT    2          STOP SCOPE LOOP
D819 0 6100                LDX   1 0
081A 0 6D00 0A7E           STX  L1 LPCNT      RESET LOOP COUNT
081C 0 4C00 0716           BSC  L  FDCYC      CONTINUE TEST
                     *
                     *                       **********************
081E 0 0000          LOOP4 DC      0          * LEVEL 4 AUTO      *
081F 0 0C00 0A5A           XIO  L  SENSE      * LEVEL RESET LOOP  *
0821 0 0C00 0A66           XIO  L  CONSL      *                   *
0823 0 0C00 0A5C           XIO  L  SENPT      *                   *
0825 0 4C40 0827           BOSC L  MOD20      **********************
                     *                       *     WAIT 34        *
                     *                       * INTERRUPT 4 LEVEL *
                     *                       * RESET DURING AUTO *
                     *                       * SCOPE LOOP.       *
                     *                       * PUSH START TO GO  *
                     *                       * TO WAIT 1.        *
                     *                       **********************
0827 0 3034          MOD20 WAIT    /34
D828 0 4C00 0503           BSC  L  MAPIT
                     *
                     ***********************************************
                     * INTERRUPT VECTOR SETUP.                     *
                     ***********************************************
082A 0 6100          SETUP LDX   1 0
0828 D 6D00 0A7C           STX  L1 GDCNT      RESET GOOD PASS CNT
082D 0 6500 D898           LDX  L1 INT00
082F D 6D00 0008           STX  L1 /0008
D831 0 6500 092E           LDX  L1 INT01
0833 0 6D00 00D9           STX  L1 /0009
0835 0 6500 0943           LDX  L1 INT02
0837 0 6D00 000A           STX  L1 /000A
0839 0 6500 0958           LDX  L1 INT03
0838 0 6D00 0008           STX  L1 /000B
083D 0 6500 08B3           LDX  L1 INT04
083F 0 6DD0 DD0C           STX  L1 /0D0C
0841 0 65D0 096D           LDX  L1 INT05
0843 0 6D00 000D           STX  L1 /000D
0845 0 65DD 0982           LDX  L1 ADR12
0847 0 6000 0000           STX  L1 /0000
                     *
0849 0 6100          RESET LDX   1 0
084A 0 6200                LDX   2 0
084B 0 6300                LDX   3 0
                     *
084C 0 0C00 0A5A     BUZY  XIO  L  SENSE        SENSE OSW
084E 0 1801                SRA      1         SET UP TO CHK BIT 14
084F 0 4C04 084C           8SC  L  BUZY,E     CHECK FOR BUSY
0851 0 0C00 0A68           XIO  L  BITSW      SENSE 8IT SWITCHES
0853 0 C400 0A79           LD   L  BITS1      LOAD BIT SWITCHES
0855 0 180C                SRA      12        CHK FOR WAIT 1 OPT
0856 0 4C04 08D8           8SC  L  CNTOK,E    SET UP FOR RESTORE
                     *
0858 0 6780 0A7F     START LDX   I3 DELAY       SET UP OELAY
085A 0 0C00 0A5A           XIO  L  SENSE      SENSE FOR READY
085C 0 4C04 0880           BSC  L  CKRDY,E    CHECH FOR READY
085E 0 0C00 0A72           XIO  L  RESTR
                     *
0860 0 73FF          LESS1 MOX    3 -1
0861 0 70FE                MOX      LESS1
                     ***********************************************
                     *                                             *
                     *                  WAIT 21                    *
                     *                                             *
                     * NO INTERRUPTS WERE GENERATEO WITHIN 500     *
```

```
3A807500
3A807510
3A807520
3A807530
3A807540
3A807550
3A807560
3A807570
3A807580
3A807590
3A807600
3A807610
3A807620
3A807630
3A807640
3A807650
3A807660
3A807670
3A807680
3A807690
3A807700
3A807710
3A807720
3A807730
3A807740
3A807750
3A807760
3A807770
3A807780
3A807790
3A807800
3A807810
3A807820
3A807830
3A807840
3A807850
3A807860
3A807870
3A807880
3A807890
3A807900
3A807910
3A807920
3A807930
3A807940
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3A807990
3A808000
3A808010
3A808020
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3A808040
3A808050
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3A808070
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3A808090
3A808100
3A808110
3A808120
3A808130
3A808140
3A808150
3A808160
3A808170
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                        * MSEC. AFTER A READS WAS GIVEN. THIS SHOULD*  3A808180
                        * HAVE BEEN ENOUGH TIME TO RECEIVE 80 COLUMN*  3A808190
                        * INTERRUPTS ANO AN ENO OP INTERRUPT.       *  3A808200
                        * PUSH START FOR SCOPE LOOP.                *  3A808210
                        *********************************************  3A808220
                        *                                              3A808230
0862 0 3021             MOD21 WAIT    /21       NO LEV. 0 OR 4 INTRPT  3A808240
                        *                                              3A808250
                        *********************************************  3A808260
                        *                                           *  3A808270
                        *                SCOPE LOOP                 *  3A808280
                        *                                           *  3A808290
                        * TO USE SCOPE LOOP, PRESS START. THIS WILL *  3A808300
                        * FEED CARDS AT A 2 CARD/SEC RATE WITH      *  3A808310
                        * A HALT AFTER 100 CARDS.                   *  3A808320
                        * IF AN INTERRUPT IS GENERATED DURING THIS  *  3A808330
                        * SCOPE LOOP, A WAIT WILL IDENTIFY IT.      *  3A808340
                        * MAKE SURE THERE IS A SUFFICIENT AMOUNT OF *  3A808350
                        * BLANK CARDS IN READER TO ALLOW FURTHER    *  3A808360
                        * CHECKING.                                 *  3A808370
                        *********************************************  3A808380
                        *                                              3A808390
0863 0 6100             CARDS LDX   1 0                               3A808400
0864 0 6D00 0A7C              STX   L1 GDCNT      RESET GOOO PASS CNTR  3A808410
0866 0 6500 1000              LDX   L1 /1000      NOP                   3A808420
0868 0 6D00 0862              STX   L1 MOD21      ALLOW LOOP            3A808430
086A 0 4C00 09FE              BSC   L  CNTIT      CHK COUNT OPTION      3A808440
086C 0 C400 0A7E        RETRN LD    L  LPCNT      LOOP CARD COUNTER     3A808450
086E 0 8400 0A83              A     L  K001       ADD 1                 3A808460
0870 0 D400 0A7E              STO   L  LPCNT                            3A808470
0872 0 9400 0A87        TOTAL S     L  K100       SUBTRACT 100          3A808480
0874 0 4C10 0877              BSC   L  CHECK,-    100 CARDS FED         3A808490
0876 0 70D5                   MDX      BUZY       CHECK FOR BUSY        3A808500
                        *                                              3A808510
0877 0 C400 0A7D        CHECK LD    L  CLCNT      LOAD COLUMN COUNT     3A808520
                        *********************************************  3A808530
                        *                                           *  3A808540
                        *                WAIT 2                     *  3A808550
                        *                                           *  3A808560
                        * NORMAL WAIT AFTER DESIRED NUMBER OF CARDS *  3A808570
                        * HAVE BEEN READ. PRESS START TO READ THE   *  3A808580
                        * NUM8ER OF BLANK CARDS DESIRED             *  3A808590
                        *********************************************  3A808600
                        *                                              3A808610
0879 0 3002                   WAIT    2           100 CAROS FED         3A808620
                        *                                              3A808630
087A 0 6200                   LDX   2 0                                3A808640
087B 0 6E00 0A7E              STX   L2 LPCNT      RESET LOOP COUNT      3A808650
087D 0 6E00 0A7D              STX   L2 CLCNT      RESET COLUMN COUNT    3A808660
087F 0 70CC                   MDX      8UZY       RESTART LOOP CHECK    3A808670
                        *                                              3A808680
0880 0 D400 0A80        CKROY STO   L  DSW1       STORE OSW             3A808690
0882 0 0C00 0A5A              XIO   L  SENSE      SENSE FOR READY       3A808700
0884 0 9400 0A80              S     L  DSW1       SUBTRACT LAST DSW     3A808710
0886 0 4C18 088A              BSC   L  CKRDY&10,&-                       3A808720
0888 0 4C00 085A              BSC   L  START&2    OSW CHANGED           3A808730
088A 0 0C00 0A5A              XIO   L  SENSE      RESET DSW             3A808740
088C 0 6100                   LOX   1 0                                3A808750
088D 0 6000 0A80              STX   L1 DSW1       RESET STORED DSW      3A808760
088F 0 4C04 0893              BSC   L  NORDY,E    NOT READY             3A808770
0891 0 4C00 085E              BSC   L  START&6    READY                 3A808780
                        *                                              3A808790
                        *                         *******************  3A808800
                        *                         *     WAIT 3      *  3A808810
                        *                         * READER NOT READY *  3A808820
                        *                         *******************  3A808830
0893 0 3003             NORDY WAIT    3           READER NOT READY      3A808840
0894 0 0C00 0A5A              XIO   L  SENSE      SENSE & RESET         3A808850
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0896 0 4C00 085A              BSC   L  START&2    READER READY          3A808860
                        *                                              3A808870
0898 0 0000             INTOO DC      0                                3A808880
0899 0 0C00 0A5A              XIO   L  SENSE                            3A808890
089B 0 7401 0A7D              MDX   L  CLCNT,&1   ADD 1 TO COLUMN CNT    3A808900
089D 0 6500 08B3              LDX   L1 INT04      RESTORE LEVEL 4 VEC.  3A808910
089F 0 6D00 000C              STX   L1 /000C                            3A808920
08A1 0 6680 0A9C              LDX   I2 MDFY3      MDX WAIT 22           3A808930
08A3 0 6A8E                   STX    2 MOD21      CHECK FOR LEVEL 4     3A808940
08A4 0 4C40 08A6              BOSC  L  COLGO      RESET LEVEL 0         3A808950
                        *                                              3A808960
08A6 0 0C00 0A76        COLGO XIO   L  READ                           3A808970
08A8 0 4C00 0860              BSC   L  LESS1                            3A808980
                        *********************************************  3A808990
                        *                                           *  3A809000
                        *                WAIT 22                    *  3A809010
                        *                                           *  3A809020
                        * AT LEAST 1 COLUMN INTERRUPT WAS GENERATED *  3A809030
                        * AND NO END OP GENERATED FOR LAST CARD.    *  3A809040
                        * THE NUMBER OF COLUMNS READ IS DISPLAYEO    *  3A809050
                        * IN THE A REG.                             *  3A809060
                        * PUSH START FOR SCOPE LOOP.                *  3A809070
                        *********************************************  3A809080
08AA 0 3022             MOD22 WAIT    /22       NO LEVEL 4 RECIEVED   3A809090
                        *********************************************  3A809100
                        *                SCOPE LOOP                 *  3A809110
                        *********************************************  3A809120
                        *                                              3A809130
08AB 0 6500 0001              LDX   L1 /0001      NOP                   3A809140
08AD 0 6D00 08AA              STX   L1 MOD22      ALLOW LOOP            3A809150
08AF 0 6100                   LDX   1 0           RESET COLUMN COUNT    3A809160
08B0 0 6D00 0A7D              STX   L1 CLCNT                            3A809170
08B2 0 70B0                   MDX      MOD21&1    BRANCH TO LOOP        3A809180
                        *                                              3A809190
08B3 0 0000             INT04 DC      0                                3A809200
08B4 0 0C00 0A5A              XIO   L  SENSE                            3A809210
08B6 0 7401 0A7C              MDX   L  GDCNT,&1   ADD 1 TO GOOD PASS    3A809220
08B8 0 6500 3021              LDX   L1 /3021                            3A809230
08BA 0 6D00 0862              STX   L1 MOD21      RESTORE WAIT 21       3A809240
08BC 0 6500 3022              LDX   L1 /3022                            3A809250
08BE 0 6D00 08AA              STX   L1 MOD22      RESTORE WAIT 22       3A809260
08C0 0 C400 0A7D              LD    L  CLCNT      LOAD COLUMN COUNT     3A809270
08C2 0 9400 0A86              S     L  K080       CHECK FOR 80 COLUMNS  3A809280
08C4 0 4C58 08DB              BOSC  L  CNTOK,&-   CHECKED OK            3A809290
08C6 0 4C68 0922              BOSC  L  MOD24,Z&   BRANCH LESS THAN 80   3A809300
08C8 0 4C40 08CA              BOSC  L  CLERR                            3A809310
08CA 0 C400 0A7D        CLERR LD    L  CLCNT      LOAD COLUMN COUNT     3A809320
                        *********************************************  3A809330
                        *                WAIT 23                    *  3A809340
                        *                                           *  3A809350
                        * MORE THAN 80 COLUMN INTERRUPTS RECEIVED   *  3A809360
                        * WHEN ENO OP INTERRUPT WAS GENERATEO.NUMBER*  3A809370
                        * OF COLUMN INTERRUPTS IS OISPLAYEO IN A REG*  3A809380
                        * PUSH START FOR SCOPE LOOP.                *  3A809390
                        *********************************************  3A809400
08CC 0 3023             MOO23 WAIT    /23       MORE THAN 80 COLUMNS  3A809410
08CE 0 6100                   LDX   1 0           RESET COLUMN COUNT    3A809420
08D0 0 6000 0A70              STX   L1 CLCNT                            3A809430
08D2 0 6680 0A9D              LOX   I2 MDFY4                            3A809440
08D4 0 6E00 08CC              STX   L2 MOD23      ALLOW LOOP            3A809450
08D6 0 4C40 0863              BOSC  L  CARDS      BRANCH TO LOOP        3A809460
                        *                                              3A809470
08D6 0 6100             HOPIT LOX   1 0                               3A809480
08D7 0 6D00 0A7D              STX   L1 CLCNT      RESET COLUMN COUNT    3A809490
08D9 0 4C00 0860              BSC   L  LESS1                            3A809500
                        *                                              3A809510
08DB 0 6500 3021        CNTOK LOX   L1 /3021                          3A809520
08DD 0 6000 0862              STX   L1 MO021      RESTORE WAIT 21       3A809530
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08DF 0 6500 3022          LDX  L1 /3022
08E1 0 6000 08AA          STX  L1 MDD22      RESTORE WAIT 22                3A809540
08E3 0 6500 3023          LDX  L1 /3023                                     3A8D9550
08E5 0 6D00 08CC          STX  L1 MDD23      RESTORE WAIT 23                3A8D9560
08E7 0 6500 3024          LDX  L1 /3024                                     3A809570
08E9 0 6D00 0924          STX  L1 MOD24&2    RESTORE WAIT 24                3A809580
08E8 0 6500 3025          LDX  L1 /3025                                     3A80959D
08ED 0 6D00 0939          STX  L1 MDD25      RESTORE WAIT 25                3A809600
08EF 0 6500 3026          LOX  L1 /3026                                     3A809610
08F1 0 6000 094E          STX  L1 MDD26      RESTORE WAIT 26                3A809620
D8F3 0 6500 3027          LDX  L1 /3027                                     3A8D9630
08F5 0 6D00 0963          STX  L1 MDD27      RESTORE WAIT 27                3A809640
08F7 0 6500 3028          LDX  L1 /3D28                                     3A809650
08F9 0 6D00 0978          STX  L1 MDD28      RESTORE WAIT 28                3A809660
08F8 0 6500 3029          LDX  L1 /3D29                                     3A809670
08F0 0 6000 098D          STX  L1 MOD29      RESTORE WAIT 29                3A80968D
08FF 0 C4D0 0A7C          LD   L  GOCNT      LOAO CARD COUNT                3A809690
0901 0 9400 0A84          S    L  K010       SU8TRACT 10                    3A809700
0903 0 4C10 0913          BSC  L  WAITA,-    CHK NUM8ER OF PASSES           3A809710
0905 0 6100               LDX   1 D                                         3A809720
0906 0 6000 0A7D          STX  L1 CLCNT      RESET CDLUMN COUNT             3A809730
0908 0 6D00 0A7E          STX  L1 LPCNT      RESET LDOP CARO CNT            3A80974D
090A 0 0C00 0A68          XIO  L  8ITSW      SENSE 8IT SWITCHES             3A809750
090C 0 C400 0A79          LO   L  BITS1      LOAD BIT SWITCHES              3A8D9760
090E 0 180C               SRA       12       CHK FOR WAIT 1 DPT             3A809770
090F 0 4C04 0914          8SC  L  WAITA&1,E  RESTORE/GO TO WAIT 1           3A809780
0911 0 4C00 082D          BSC  L  SETUP&3    NOT 10 PASSES                  3A809790
                     *                                                      3A809800
                     *                      **********                      3A809810
                     *                      *  WAIT 4  *                    3A809820
0913 0 3004          WAITA WAIT    4        * DEVICE TESTEO, *             3A809830
                     *                      * RAN SUCCESSFUL. *            3A809840
                     ********************************************          3A809850
                     *                                          *          3A809860
                     *                RERUN                     *          3A809870
                     *                                          *          3A809880
                     * TO RERUN PROGRAM PRESS START.            *          3A809890
                     *                                          *          3A8D9900
                     ********************************************          3A809910
0914 0 6100               LDX   1 0                                         3A809920
0915 0 6000 0A70          STX  L1 CLCNT      RESET COLUMN COUNT             3A809930
0917 0 6D00 0A7C          STX  L1 GOCNT      RESET CARO COUNT               3A809940
0919 0 0C00 0A68          XIO  L  BITSW                                     3A809950
091B 0 C400 0A79          LD   L  BITS1                                     3A809960
091D 0 180C               SRA       12                                      3A809970
091E 0 4C04 0503     MOD12 8SC  L  MAPIT,E                                  3A809980
0920 0 4C00 06AF          8SC  L  CLRIX      RERUN PROGRAM                  3A809990
                     *                                                      3A810000
0922 0 C400 0A7D     MOD24 LD   L  CLCNT      LOAO COLUMN COUNT              3A810010
                     ********************************************          3A810020
                     *                                          *          3A810030
                     *                WAIT 24                   *          3A810040
                     *                                          *          3A810050
                     * LESS THAN 80 COLUMN INTERRUPTS RECEIVEO  *          3A810060
                     * WHEN ENO OP INTERRUPT WAS GENERATEO.NUM8ER*          3A810070
                     * OF COLUMN INTERRUPTS IS DISPLAYEO IN A REG*          3A810080
                     * PUSH START FOR SCOPE LOOP.               *          3A810090
                     ********************************************          3A810100
0924 0 3024               WAIT    /24                                     3A810110
                     *                                                      3A810120
0925 0 6100               LOX   1 0          RESET COLUMN COUNT             3A810130
0926 0 6000 0A7D          STX  L1 CLCNT                                     3A810140
0928 0 668D 0A9E          LDX  I2 MDFY5                                     3A810150
092A 0 6E00 0922          STX  L2 MOD24      ALLOW LOOP                     3A810160
092C 0 4C00 0863          8SC  L  CARDS      8RANCH TO LOOP                 3A810170
                     *                                                      3A810180
092E 0 0000          INT01 DC       0        INTERRUPT 1                    3A810190
092F D 0C00 0A5A          XIO  L  SENSE                                     3A81D200
                                                                            3A810210
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0931 0 C400 0A70          LD   L  CLCNT      LOAO CDLUMN COUNT              3A810220
0933 0 6600 092E          LDX  L2 INTO1                                     3A810230
0935 0 6E00 000C          STX  L2 /000C                                     3A810240
0937 0 4C4D 0939          8OSC L  MOD25                                     3A810250
                     ********************************************          3A810260
                     *                                          *          3A810270
                     *                WAIT 25                   *          3A810280
                     *                                          *          3A810290
                     * INTERRUPT GENERATED,CAUSED A LEVEL 1     *          3A810300
                     * ADDRESS TO 8E GENERATED.                 *          3A810310
                     * PUSH START FOR SCOPE LDOP.               *          3A810320
                     ********************************************          3A810330
0939 0 3025          MDD25 WAIT    /25        LEV 0 PICKEO 8IT 15            3A810340
                     *                                                      3A810350
093A 0 61D0               LDX   1 D          RESET CDLUMN COUNT             3A810360
093B 0 6D00 DA7D          STX  L1 CLCNT                                     3A810370
093D 0 6680 0A9F          LDX  I2 MDFY6      ALLOW LDOP                     3A810380
093F D 6E0D 0939          STX  L2 MDD25      ALLDW LDOP                     3A810390
0941 0 4C00 0863          8SC  L  CAROS      8RANCH TD LDOP                 3A810400
                     *                                                      3A810410
0943 D 000D          INT02 DC       0        INTERRUPT 2                    3A810420
0944 0 0C00 0A5A          XIO  L  SENSE                                     3A810430
D946 D C400 0A7D          LD   L  CLCNT      LOAO CDLUMN CDUNT              3A810440
0948 0 6600 0943          LDX  L2 INTO2                                     3A810450
094A 0 6E00 000C          STX  L2 /000C                                     3A810460
094C 0 4C40 094E          BOSC L  MOD26                                     3A810470
                     ********************************************          3A810480
                     *                                          *          3A810490
                     *                WAIT 26                   *          3A810500
                     *                                          *          3A810510
                     * INTERRUPT GENERATED,CAUSED A LEVEL 2     *          3A810520
                     * AOORESS TO 8E GENERATED.                 *          3A810530
                     * PUSH START FOR SCOPE LOOP.               *          3A810540
                     ********************************************          3A810550
094E 0 3026          MOD26 WAIT    /26        LEV 0 PICKED BIT 14            3A810560
                     *                                                      3A810570
094F 0 6100               LOX   1 0          RESET COLUMN COUNT             3A810580
0950 0 6000 0A70          STX  L1 CLCNT                                     3A810590
0952 0 6680 0AA0          LOX  I2 MDFY7      ALLOW LOOP                     3A810600
0954 0 6E00 094E          STX  L2 MOD26                                     3A810610
0956 0 4C00 0863          8SC  L  CARDS      8RANCH TO LOOP                 3A810620
                     *                                                      3A810630
0958 0 000D          INT03 DC       0        INTERRUPT 3                    3A810640
0959 0 0C00 0A5A          XIO  L  SENSE                                     3A810650
095B 0 C400 0A7D          LD   L  CLCNT      LOAO COLUMN COUNT              3A810660
095D 0 6600 0958          LDX  L2 INT03                                     3A810670
095F 0 6E00 000C          STX  L2 /000C                                     3A810680
0961 0 4C40 0963          BOSC L  MOD27                                     3A810690
                     ********************************************          3A810700
                     *                                          *          3A810710
                     *                WAIT 27                   *          3A810720
                     *                                          *          3A810730
                     * INTERRUPT GENERATED,CAUSED A LEVEL 3     *          3A810740
                     * ADORESS TO BE GENERATEO.                 *          3A810750
                     * PUSH START FOR SCOPE LOOP.               *          3A810760
                     ********************************************          3A810770
0963 0 3027          MO027 WAIT    /27        LEV 0 PICKED 14&15             3A810780
                     *                                                      3A810790
0964 0 6100               LDX   1 0          RESET COLUMN COUNT             3A810800
0965 0 6D00 0A70          STX  L1 CLCNT                                     3A810810
0967 0 6680 0AA1          LDX  I2 MDFY8      ALLOW LOOP                     3A810820
0969 0 6E00 0963          STX  L2 MOD27                                     3A810830
0968 0 4CD0 0863          8SC  L  CARDS      8RANCH TO LODP                 3A810840
                     *                                                      3A810850
0960 0 0000          INT05 DC       0        INTERRUPT 5                    3A810860
096E 0 0C00 0A5A          XIO  L  SENSE                                     3A810870
0970 0 C400 0A7D          LD   L  CLCNT      LOAD COLUMN COUNT              3A810880
0972 0 6600 0960          LDX  L2 INT05                                     3A810890
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0974 0 6E00 000C          STX  L2 /000C                              3A810900
0976 0 4C40 0978          80SC L  MDD28                              3A810910
                        ********************************************* 3A810920
                        *                                           * 3A810930
                        *                 WAIT 28                   * 3A810940
                        *                                           * 3A810950
                        * INTERRUPT GENERATED,CAUSED A LEVEL 5       * 3A810960
                        * ADDRESS TO BE GENERATED.                  * 3A810970
                        * PUSH START FOR SCOPE LOOP.                * 3A810980
                        ********************************************* 3A810990
0978 0 3028             MOD28 WAIT    /28         LEV 0 PICKED 13&15 3A811000
                        *                                           3A811010
0979 0 6100                 LDX   1 0           RESET COLUMN COUNT    3A811020
097A 0 6D00 0A7D            STX  L1 CLCNT                             3A811030
097C 0 6680 0AA2            LDX  I2 MDFY9       ALLOW LOOP            3A811040
097E 0 6E00 0978            STX  L2 MOD28                             3A811050
0980 0 4C00 0863            BSC  L  CARDS       8RANCH TO LOOP        3A811060
                        *                                           3A811070
0982 0 0000             ADR12 DC      0                             3A811080
0983 0 0C00 0A5A            XIO  L  SENSE                             3A811090
0985 0 C400 0A7D            LD   L  CLCNT                             3A811100
0987 0 6600 0982            LDX  L2 ADR12                             3A811110
0989 0 6E00 000C            STX  L2 /000C                             3A811120
0988 0 4C40 098D            80SC L  MOD29                             3A811130
                        ********************************************* 3A811140
                        *                                           * 3A811150
                        *                 WAIT 29                   * 3A811160
                        *                                           * 3A811170
                        * BIT 12 WAS DROPPED WHEN INTERRUPT LEVEL    * 3A811180
                        * 0 WAS GENERATED.                          * 3A811190
                        * PUSH START FOR SCOPE LOOP.                * 3A811200
                        ********************************************* 3A811210
                        *                                           3A811220
098D 0 3029             MOD29 WAIT    /29         INT 0 DROPPED BIT 12 3A811230
                        *                                           3A811240
098E 0 6100                 LDX   1 0           RESET COLUMN COUNT    3A811250
098F 0 6D00 0A7D            STX  L1 CLCNT                             3A811260
0991 0 6680 0A98            LDX  I2 MDFY2       ALLOW LOOP            3A811270
0993 0 6E00 098D            STX  L2 MOD29                             3A811280
0995 0 4C00 0863            BSC  L  CARDS       8RANCH TO LOOP        3A811290
                        *                                           3A811300
0997 0 4C00 08D6        JUMP  8SC  L  HOPIT                         3A811310
                        *                                           3A811320
0999 0 0C00 0A68        CNTCK XIO  L  BITSW     READ BIT SWITCHES     3A811330
0998 0 C400 0A79              LD   L  8ITS1     LOAD 8IT SWITCHES     3A811340
099D 0 4C04 09B0              BSC  L  KNT01,E   SELECT COUNT OF 10    3A811350
099F 0 1801                   SRA      1        CHK COUNT OF 50       3A811360
09A0 0 4C04 09B8              BSC  L  KNT02,E   SELECT COUNT OF 50    3A811370
09A2 0 1801                   SRA      1        CHK COUNT OF 250      3A811380
09A3 0 4C04 09C0              BSC  L  KNT03,E   SELECT COUNT OF 250   3A811390
09A5 0 1801                   SRA      1        CHK COUNT OF 25000    3A811400
09A6 0 4C04 09C8              8SC  L  KNT04,E   SEL COUNT OF 25000    3A811410
09A8 0 6500 0A87              LDX  L1 K100                           3A811420
09AA 0 6D00 06FF              STX  L1 NUMBR&1   SET UP CNT OF 100     3A811430
09AC 0 D500 0724              STO  L1 NUMCK&1   SET UP LOOP COUNT     3A811440
09AE 0 4C00 09D0              BSC  L  CKOVR                          3A811450
                        *                                           3A811460
09B0 0 6500 0AB4        KNT01 LDX  L1 K010                          3A811470
09B2 0 6D00 06FF              STX  L1 NUMBR&1   SET UP CNT OF 10    3A811480
09B4 0 D500 0724              STO  L1 NUMCK&1   SET UP LDDP COUNT    3A811490
09B6 0 4C00 09D0              BSC  L  CKOVR                          3A811500
                        *                                           3A811510
09B8 0 6500 0A85        KNT02 LDX  L1 K050                          3A811520
09BA 0 6D00 06FF              STX  L1 NUM8R&1   SET UP CNT OF 50    3A811530
09BC 0 D500 0724              STO  L1 NUMCK&1   SET UP LOOP COUNT    3A811540
09BE 0 4C00 09D0              BSC  L  CKOVR                          3A811550
                        *                                           3A811560
09C0 0 6500 0A88        KNT03 LDX  L1 K250                          3A811570
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09C2 0 6D00 06FF              STX  L1 NUMBR&1   SET UP CNT OF 250     3A811580
09C4 0 D500 0724              STD  L1 NUMCK&1   SET UP LOOP COUNT     3A811590
09C6 0 4C00 09D0              BSC  L  CKOVR                          3A811600
                        *                                           3A811610
09C8 0 6500 0A89        KNT04 LDX  L1 KMAX                          3A811620
09CA 0 6D00 06FF              STX  L1 NUMBR&1   SET UP CNT OF 25000   3A811630
09CC 0 D500 0724              STO  L1 NUMCK&1   SET UP LOOP COUNT     3A811640
09CE 0 4C00 09D0              BSC  L  CKOVR                          3A811650
                        *                                           3A811660
09D0 0 0C00 0A68        CKOVR XIO  L  BITSW     READ BIT SWITCHES     3A811670
09D2 0 C400 0A79              LD   L  BITS1     LOAD BIT SWITCHES     3A811680
09D4 0 1804                   SRA      4        DELAY CHANGE          3A811690
09D5 0 4C04 09E6              BSC  L  NODLY,E   ND DELAY SELECTED     3A811700
09D7 0 1801                   SRA      1        CHECK FOR DELAY       3A811710
09D8 0 4C04 09EC              8SC  L  DLY01,E   SELECTED DELAY        3A811720
09DA 0 1801                   SRA      1        CHECK FOR DELAY       3A811730
09D8 0 4C04 09F2              8SC  L  DLY02,E   SELECTED DELAY        3A811740
09DD 0 1801                   SRA      1        CHECK FOR DELAY       3A811750
09DE 0 4C04 09F8              BSC  L  DLY03,E   SELECTED DELAY        3A811760
09E0 0 6500 0A7F              LDX  L1 DELAY     SET DELAY FOR .5 SEC  3A811770
09E2 0 6D00 06E9              STX  L1 TEST1&1   SET UP DELAY          3A811780
09E4 0 4C00 06DC              BSC  L  8USY                           3A811790
                        *                                           3A811800
09E6 0 6500 0A82        NODLY LDX  L1 K000      LDAD ZERD             3A811810
09E8 0 6D00 06E9              STX  L1 TEST1&1   SET UP NO DELAY       3A811820
09EA 0 4C00 06DC              BSC  L  BUSY                           3A811830
                        *                                           3A811840
09EC 0 6500 0A8A        DLY01 LDX  L1 TIME1                         3A811850
09EE 0 6D00 06E9              STX  L1 TEST1&1   SET UP DELAY         3A811860
09F0 0 4C00 06DC              8SC  L  BUSY                           3A811870
                        *                                           3A811880
09F2 0 6500 0A8B        DLY02 LDX  L1 TIME2                         3A811890
09F4 0 6D00 06E9              STX  L1 TEST1&1   SET UP DELAY         3A811900
09F6 0 4C00 06DC              BSC  L  BUSY                           3A811910
                        *                                           3A811920
09F8 0 6500 0A8C        DLY03 LDX  L1 TIME3                         3A811930
09FA 0 6D00 06E9              STX  L1 TEST1&1   SET UP DELAY         3A811940
09FC 0 4C00 06DC              BSC  L  8USY                           3A811950
                        *                                           3A811960
09FE 0 0C00 0A68        CNTIT XIO  L  BITSW     READ BIT SWITCHES     3A811970
0A00 0 C400 0A79              LD   L  BITS1     LOAD BIT SWITCHES     3A811980
0A02 0 4C04 0A13              BSC  L  CNT01,E   SEL CARD CNT OF 10    3A811990
0A04 0 1801                   SRA      1        CHK CARD CNT OF 50    3A812000
0A05 0 4C04 0A19              8SC  L  CNT02,E   SEL CARD CNT OF 50    3A812010
0A07 0 1801                   SRA      1        CHK CARD CNT OF 250   3A812020
0A08 0 4C04 0A1F              BSC  L  CNT03,E   SEL CARD CNT OF 250   3A812030
0A0A 0 1801                   SRA      1        CHK CARD CNT OF 25K   3A812040
0A0B 0 4C04 0A25              8SC  L  CNT04,E   SEL CARD CNT OF 25K   3A812050
0A0D 0 6500 0A84              LDX  L1 K010                           3A812060
0A0F 0 6D00 0873              STX  L1 TOTAL&1   SET UP CNT OF 10     3A812070
0A11 0 4C00 0A2B              BSC  L  ENDCK                          3A812080
                        *                                           3A812090
0A13 0 6500 0A84        CNT01 LDX  L1 K010                          3A812100
0A15 0 6D00 0873              STX  L1 TOTAL&1   SET UP CNT OF 10     3A812110
0A17 0 4C00 0A2B              BSC  L  ENDCK                          3A812120
                        *                                           3A812130
0A19 0 6500 0A85        CNT02 LDX  L1 K050                          3A812140
0A1B 0 6D00 0873              STX  L1 TOTAL&1   SET UP CNT OF 50     3A812150
0A1D 0 4C00 0A2B              BSC  L  ENDCK                          3A812160
                        *                                           3A812170
0A1F 0 6500 0A88        CNT03 LDX  L1 K250                          3A812180
0A21 0 6D00 0873              STX  L1 TOTAL&1   SET UP CNT OF 250    3A812190
0A23 0 4C00 0A2B              BSC  L  ENDCK                          3A812200
                        *                                           3A812210
0A25 0 6500 0A89        CNT04 LDX  L1 KMAX                          3A812220
0A27 0 6D00 0873              STX  L1 TOTAL&1   SET UP CNT OF 25000  3A812230
0A29 0 4C00 0A2B              BSC  L  ENDCK                          3A812240
                        *                                           3A812250
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```
0A2B 0 0C00 0A68    ENDCK XID  L  BITSW      READ BIT SWITCHES          3A812260
0A2D 0 C400 0A79          LD   L  8ITS1      LOAD BIT SW1TCHES          3A812270
0A2F 0 1804               SRA     4          DELAY CHANGE               3A812280
0A30 0 4C04 0A41          BSC  L  DLYNO,E    ND DELAY SELECTED          3A812290
0A32 0 1801               SRA     1          CHECK FOR DELAY            3A8123D0
0A33 0 4C04 0A47          BSC  L  DLAY1,E    SELECTED DELAY             3A812310
0A35 0 1801               SRA     1          CHECK FOR DELAY            3A81232D
0A36 0 4C04 0A4D          BSC  L  DLAY2,E    SELECTED DELAY             3A812330
0A38 0 1801               SRA     1          CHECK FOR DELAY            3A81234D
0A39 0 4C04 0A53          BSC  L  DLAY3,E    SELECTED DELAY             3A812350
0A3B 0 6500 DA7F          LDX  L1 DELAY      SET DELAY FOR .5 SEC       3A812360
0A3D 0 6D00 0859          STX  L1 START&1    SET UP DELAY               3A812370
0A3F 0 4C00 086C          BSC  L  RETRN                                 3A812380
                          *                                             3A81239D
0A41 0 6500 0A82    DLYND LDX  L1 K000       LOAD ZERD                  3A812400
0A43 0 6D00 0859          STX  L1 START&1    SET UP ND DELAY            3A81241D
0A45 0 4C00 086C          BSC  L  RETRN                                 3A812420
                          *                                             3A812430
0A47 0 6500 0A8A    DLAY1 LDX  L1 TIME1                                 3A812440
0A49 0 6D00 0859          STX  L1 START&1    SET UP DELAY               3A812450
0A4B 0 4C00 086C          BSC  L  RETRN                                 3A812460
                          *                                             3A812470
0A4D 0 6500 0A8B    DLAY2 LDX  L1 TIME2                                 3A812480
0A4F 0 6D00 0859          STX  L1 START&1    SET UP DELAY               3A812490
0A51 0 4C00 086C          8SC  L  RETRN                                 3A8125D0
                          *                                             3A812510
0A53 0 6500 0A8C    DLAY3 LDX  L1 TIME3                                 3A812520
0A55 0 6D00 0859          STX  L1 START&1    SET UP DELAY               3A812530
0A57 0 4C00 086C          BSC  L  RETRN                                 3A812540
                          *                                             3A81255D
0A5A   0000               BSS  E  0                                     3A812560
0A5A 0 0000         SENSE DC      D          RESET DSW                  3A812570
0A5B 0 1703               DC      /1703                                 3A812580
0A5C 0 0000         SENPT DC      0                                     3A812590
0A5D 0 1F01               DC      /1F01                                 3A8126D0
0A5E 0 0000         SEN25 DC      0          SENSE 2501 DSW             3A812610
0A5F 0 4F03               DC      /4F03                                 3A812620
0A60 0 0000         DISK  DC      0                                     3A812630
0A61 0 2701               DC      /2701                                 3A812640
0A62 0 0000         PLOT  DC      0                                     3A812650
0A63 0 2F01               DC      /2F01                                 3A812660
0A64 0 0000         PRINT DC      0                                     3A812670
0A65 0 3701               DC      /3701                                 3A812680
0A66 0 0000         CONSL DC      D                                     3A812690
0A67 0 0F01               DC      /0F01                                 3A812700
0A68 0 0A79         BITSW DC      8ITS1                                 3A812710
0A69 0 3A00               DC      /3A00                                 3A812720
0A6A 0 0000         STOP  DC      0                                     3A812730
0A6B 0 3F01               DC      /3F01                                 3A812740
0A6C 0 0000         FEED  DC      0                                     3A812750
0A6D 0 1402               DC      /1402                                 3A812760
0A6E 0 0A70         FEEDS DC      TABLE                                 3A812770
0A6F 0 4E00               DC      /4ED0                                 3A812780
0A70 0 0001         TABLE DC      1                                     3A812790
0A71 0 0000               DC      0                                     3A8128D0
0A72 0 0000         RESTR DC      0                                     3A812810
0A73 0 1404               DC      /1404      READER START               3A812820
0A74 0 0000         CNTRL DC      0                                     3A812830
0A75 0 1C00               DC      /1C00      ADVANCE TAPE               3A812840
0A76 0 0A78         READ  DC      RAREA                                 3A812850
0A77 0 1200               DC      /1200                                 3A812860
0A78   0001         RAREA BSS     1                                     3A812870
0A79 0 0000         BITS1 DC      0          BIT SWITCH SETTINGS        3A812880
0A7A 0 0000         BITS2 DC      0          LAST DEVICE SELECTED       3A812890
0A7B 0 0000         BITS3 DC      0          LEVEL ON BITS              3A812900
0A7C 0 0000         GDCNT DC      0          GOOD PASS COUNT            3A812910
0A7D 0 0000         CLCNT DC      0          COLUMN COUNT               3A812920
0A7E 0 0000         LPCNT DC      0          LOOP COUNT                 3A812930
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0A7F 0 F700         DELAY DC      /F700      SCOPE LOOP DELAY           3A812940
0A80 0 0000         DSW1  DC      0                                     3A812950
0A81 0 0001         ADD01 DC      1                                     3A812960
0A82 0 0000         K000  DC      0          CONSTANT ZERO              3A812970
0A83 0 0001         K001  DC      1          CONSTANT 1                 3A812980
0A84 0 000A         K010  DC      10         CONSTANT 10                3A812990
0A85 0 0032         K050  DC      50         CONSTANT 50                3A813000
0A86 0 0050         K080  DC      80         CONSTANT 80                3A813010
0A87 0 0064         K100  DC      100        CONSTANT 100               3A813020
0A88 0 00FA         K250  DC      250        CONSTANT 250               3A813030
0A89 0 61A8         KMAX  DC      /61A8      CONSTANT 25000             3A813040
0A8A D 0DE0         TIME1 DC      /0DE0      DELAY - 62.5 MSEC          3A813050
0A8B 0 1EE0         TIME2 DC      /1EE0      DELAY - 125 MSEC           3A813060
0A8C 0 3DC0         TIME3 DC      /3DC0      DELAY - 250 MSEC           3A813070
0A8D D 1D00         NOPIT DC      /1000                                 3A813080
DA8E 0 1801         SRA01 DC      /1801                                 3A813090
0A8F 0 180A         SRA10 DC      /180A                                 3A813100
0A90 0 1808         SRA11 DC      /180B                                 3A81311C
0A91 0 70E9         MOFYA MDX  X  BUSY-MOD11-1                          3A813120
0A92 0 7078         MOFY8 MDX  X  GAPIT-MOD13-1                         3A813130
0A93 0 706B         MOFYC MDX  X  GAPIT-MOD14-1                         3A813140
0A94 0 705B         MOFYD MDX  X  GAPIT-MOD15-1                         3A813150
0A95 0 704B         MOFYE MDX  X  GAPIT-MOD16-1                         3A813160
0A96 0 70F4         MOFYF MDX  X  GAPIT-MOD17-1                         3A813170
0A97 0 70D4         MOFYG MDX  X  GAPIT-MOD18-1                         3A813180
0A98 0 70C8         MOFYH MDX  X  GAPIT-MOD19-1                         3A813190
0A99 0 708C         MOFYJ MDX  X  GAPIT-MOD1A-1                         3A813200
0A9A 0 701A         MOFYL MDX  X  CKRUN-MOD11-1                         3A813210
0A9B 0 7009         MDFY2 MDX  X  JUMP-MOD29-1                          3A813220
0A9C 0 7047         MDFY3 MDX  X  MOD22-MOD21-1                         3A813230
0A9D 0 7009         MDFY4 MDX  X  HOPIT-MOD23-1                         3A813240
0A9E 0 7083         MDFY5 MDX  X  HOPIT-MOD24-1                         3A813250
0A9F 0 709C         MDFY6 MDX  X  HOPIT-MOD25-1                         3A813260
0AA0 0 7087         MDFY7 MDX  X  HOPIT-MOD26-1                         3A813270
0AA1 0 7033         MDFY8 MDX  X  JUMP-MOD27-1                          3A813280
DAA2 0 701E         MDFY9 MDX  X  JUMP-MOD28-1                          3A813290
0AA4   0501               END     BEGIN                                 3A813300
 NO STATEMENTS FLAGGED IN THE A8OVE ASSEMBLY
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C R O S S R E F E R E N C E

NAME	VALUE	REFERENCES
ADD01	0A81	06FA
ADR12	0982	0845,0987
BA012	070C	051B,05EB,0635,067D
BAD14	07E8	051F,05ED,0637,067F
BEGIN	0501	0AA4
BITSW	0A68	052C,053F,0614,065C,06A4,06E1,07AD,0851,090A,0919,0999,09D0,09FE 0A2B
BITS1	0A79	052E,0541,0616,065E,06A6,06E3,07AF,0853,090C,091B,099B,09D2,0A00 0A2D,0A68
BITS2	0A7A	0531,0619,0661,06A9
BITS3	0A7B	0544,0549
BUSY	06DC	05D7,05F7,0621,0641,0669,0689,06DF,0715,07DA,09E4,09EA,09F0,09F6 09FC,0A91
BUZY	084C	084F,0876,087F
CARDS	0863	08D4,092C,0941,0956,096B,0980,0995
CHECK	0877	0874
CKBIT	0579	054B
CKDOK	07C8	05E9,0633,067B,0711
CKLOP	053F	061B,0663,06AB
CKOVR	09D0	09AE,0986,098E,09C6,09CE
CKRDY	0880	085C,0886
CKRUN	070D	06F2,0A9A
CLCNT	0A7D	0877,087D,089B,0880,08C0,08CA,08CE,08D7,0906,0915,0922,0926,0931 093B,0946,0950,095B,0965,0970,097A,0985,098F
CLERR	08CA	08C8
CLRIX	06AF	0553,07B4,0920
CNTCK	0999	0719
CNT1T	09FE	086A
CNTOK	08DB	0856,08C4
CNTRL	0A74	064B
CNT01	0A13	0A02
CNT02	0A19	0A05
CNT03	0A1F	0A08
CNT04	0A25	0A0B
COLGO	08A6	08A4
CONSL	0A66	0821
DELAY	0A7F	06E8,0858,09E0,0A3B
DISK	0A60	0752
DLAY1	0A47	0A33
DLAY2	0A4D	0A36
DLAY3	0A53	0A39
DLYNO	0A41	0A30
DLY01	09EC	0908
DLY02	09F2	09DB
DLY03	09F8	09DE
DSWCK	0800	05F1,05F3,05FD,05FF,0638,0630,0647,0649,0683,0685,068F,0691,06ED 0807
DSW1	0A80	0800,0805,080F,0880,0884,088D
ENDCK	0A2B	0A11,0A17,0A1D,0A23,0A29
ERROR	071B	071C,0786
FOCYC	0716	070C,0727,072F,07E6,07F2,07FE,081C
FEED	0A6C	0601,06EF
FEEDS	0A6E	0693
FINSH	07A9	0600,0611,0655,0659,069D,06A1
GAPIT	0786	0A92,0A93,0A94,0A95,0A96,0A97,0A98,0A99
GDCNT	0A7C	06F6,0717,07A3,07A7,082B,0864,0886,08FF,0917
GOLOP	0555	0585,058F,0599,05A3,05AD,05B7
HOPIT	08D6	0997,0A9D,0A9E,0A9F,0AA0
INT00	0898	082D
INT01	092E	0831,0933
INT02	0943	0835,0948
INT03	0958	0839,095D
INT04	0883	083D,089D
INT05	096D	0841,0972
JUMP	0997	0A9B,0AA1,0AA2
KMAX	0A89	09C8,0A25
KNT01	09B0	099D
KNT02	0988	09A0
KNT03	09C0	09A3
KNT04	09C8	09A6
K000	0A82	09E6,0A41
K001	0A83	071F,07A5,086E
K010	0A84	0608,07A9,0901,0980,0A0D,0A13
K050	0A85	09B8,0A19
K080	0A86	08C2
K100	0A87	0605,064F,0697,06FE,0723,0872,09A8
K250	0A88	09C0,0A1F
LESS1	0860	0861,08A8,08D9
LOOPS	0575	0578,0583,0589,0593,059D,05A7,05B1
LOOP0	0731	0581
LOOP1	0741	0587,0588
LOOP2	0751	0591,0595
LOOP3	0761	059B,059F
LOOP4	081E	05A5,05A9
LOOP5	0788	05AF,0583
LPCNT	0A7E	06F8,06FC,071D,0721,072D,0775,081A,086C,0870,0878,0908
MAPIT	0503	073F,074F,075F,076F,07C6,0828,091E
MDFY2	0A98	0991
MOFY3	0A9C	08A1
MDFY4	0A9D	08D0
MDFY5	0A9E	0928
MDFY6	0A9F	093D
MDFY7	0AA0	0952
MOFY8	0AA1	0967
MDFY9	0AA2	097C
MOD1A	07F9	06C6,07A1,07F7,07FC,0A99
MOD11	06F2	06F4,070A,0710,0779,07D4,0A91,0A9A
MOD12	091E	0569
MOO13	073A	0557,0568,0688,06CA,0738,073D,0785,0A92
MOD14	074A	055B,056D,068A,06CE,0748,074D,0789,0A93
MOD15	075A	055F,056F,06BC,06D2,0758,075D,0780,0A94
MOD16	076A	0563,0571,068E,06D6,0768,076D,0791,0A95
MOD17	07C1	0567,0573,06C0,06DA,0795,078F,07C4,0A96
MOD18	07E1	06C2,0799,07DF,07E4,0A97
MOD19	07ED	06C4,079D,07E8,07F0,0A98
MOD20	0827	0825
MOD21	0862	0868,08A3,0882,08BA,08DD,0A9C
MOD22	08AA	08A0,088E,08E1,0A9C
MOO23	08CC	08D2,08E5,0A9D
MOD24	0922	08C6,08E9,092A,0A9E
MOD25	0939	08ED,0937,093F,0A9F
MOD26	094E	08F1,094C,0954,0AA0
MOD27	0963	08F5,0961,0969,0AA1
MOD28	0978	08F9,0976,097E,0AA2
MOD29	098D	08FD,0988,0993,0A98
MOFYA	0A91	07D2
MOFY8	0A92	0738
MOFYC	0A93	0748
MOFYD	0A94	0758
MOFYE	0A95	0768
MOFYF	0A96	07C2
MOFYG	0A97	07E2
MOFYH	0A98	07EE
MOFYJ	0A99	07FA
MOFYL	0A9A	0777
NOADR	07F4	0523,05EF,0639,0681
NODLY	09E6	09D5
NOPIT	0A8D	05F9,068B
NORDY	0893	088F
NRDYA	058F	05BB
NRDYB	05C9	05C5
NRDYC	05D2	05CE
NUMBR	06FE	0607,0651,0699,09AA,09B2,098A,09C2,09CA
NUMCK	0723	0609,0653,069B,0686,09AC,09B4,09BC,09C4,09CC

IBM MAINTENANCE DIAGNOSTIC PROGRAM FOR THE 1130 SYSTEM
INTERRUPT TEST

DATE 01MAY66 15NOV66 15JUN67 15FEB68
EC NO. 415490B 419605 420317 420403

```
PLOT   0A62  0762
PRINT  0A64  0742
RAREA  0A78  0A76
READ   0A76  08A6
RESET  0849
RESTR  0A72  085E
RETRN  086C  0A3F,0A45,0A4B,0A51,0A57
RUNCK  06F1  0709,070F,077D,07D0
RUNOK  0702  070B,0781
SENPT  0A5C  05C2,061F,0732,0823
SENSE  0A5A  05B9,05D5,06DC,06EA,072A,0736,0746,0756,0766,0772,078D,07C9,07D0
             07E9,07F5,0802,080B,081F,084C,085A,0882,088A,0894,0899,08B4,092F
             0944,0959,096E,0983
SEN25  0A5E  05CC,0667
SETPT  061F  05C7
SETUP  082A  060F,07AB,0911
SET25  0667  05D0
SET42  05D5  05BD
SRA01  0A8E  05F5,0687
SRA10  0A8F  0643
SRA11  0A90  063F
START  0858  0888,0891,0896,0A3D,0A43,0A49,0A4F,0A55
STOP   0A6A  07B9
TABLE  0A70  0A6E
TEST1  06E8  05D9,05FB,0603,0623,0645,064D,066B,068D,0695,0809,0813,0816,09E2
             09E8,09EE,09F4,09FA
TIME1  0A8A  09EC,0A47
TIME2  0A8B  09F2,0A4D
TIME3  0A8C  09F8,0A53
TOTAL  0872  0A0F,0A15,0A1B,0A21,0A27
VECT0  0581  0547
VECT1  0587  057F
VECT2  0591  054E
VECT3  059B  057A
VECT4  05A5  0551
VECT5  05AF  057D
VEC00  0735  0503,0500,0627,066F,0734
VEC01  0745  0507,05DF,0629,0671,0744
VEC02  0755  0508,05E1,062B,0673,0754
VEC03  0765  050F,05E3,0620,0675,0764
VEC04  0771  0513,05E5,062F,0677,06B2,06E6,0703,07D6
VEC05  07BC  0517,05E7,0631,0679,07BB
WAITA  0913  0657,069F,07B2,0903,090F
WAITC  07CD  07CB
WAITF  0502
WAITG  0729  05DB,0625,066D,0725
WAIT1  0528  052B,0576
WAIT2  0818  0700
WAIT3  0815  0811
WAIT8  053C
WHAT1  05B9  053A
WHAT2  05C2  0537
WHAT3  05CC  0534
WHICH  0529  0527,053D,05C0,05CA,05D3,061D,0665,06AD

END OF ASSEMBLY
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---------- LAST PAGE ----------

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1.  PURPOSE       ************************************************** 30A00020
                  *  OISK ADJUSTMENT PROGRAM                       * 30A00030
                  ************************************************** 30A00040
                  *                                                  30A00050
                  * THE 1130 OISK ACCESS PROGRAM WAS DESIGNED TO 8E  30A00060
                  * USEO WITH THE ACCESS ADJUSTMENT PROCEOURE FOUND  30A00070
                  * IN THE SDS MAINTENANCE MANUAL.                   30A00080
                  *                                                  30A00090
                  * THE PROGRAM WILL MOVE THE ACCESS ARM 8ETWEEN     30A00100
                  * TRACKS 2 ANO 200, AND COMPARE SECTOR ZERO        30A00110
                  * AOORESSES AT THOSE TRACKS.                       30A00120
                  *                                                  30A00130
                  * THE SEEK OPERATION CAN BE SELECTEO IN EITHER 10  30A00140
                  * OR 20 MILL MODE.                                 30A00150
                  *                                                  30A00160
                  ************************************************** 30A00170
                  *                                                  30A00180
                  * THE C.E. MUST HAVE A 1130 SYSTEM WITH CARD       30A00190
                  * READER OR PAPER TAPE INPUT.                      30A00200
                  *                                                  30A00210
                  * THE PROGRAM MUST 8E LOAOEO 8Y A                  30A00220
                  * RELOCATA8LE LOADER, IF 1442 USE                  30A00230
                  * PIO 03AA, IF 2501 USE 03A8, IF                   30A00240
                  * PAPER TAPE USE 03AC.                             30A00250
                  *                                                  30A00260
3.  USE PROCEOURE ************************************************** 30A00270
                  *                                                  30A00280
3.1.1 PROGRAM     *                                                  30A00290
      LOADING     * TO LDAO FROM CARDS.                             30A00300
                  *                                                  30A00310
                  * A. PLACE THE RELOCATING LOAOER, AND THE OISK     30A00320
                  *    ADJUST TEST IN THE READER IN THAT OROER.      30A00330
                  * 8. MAKE READER READY.                            30A00340
                  * C. PRESS THE 1131 RESET KEY.                     30A00350
                  * O. PRESS THE 1131 PROGRAM LOAO KEY.              30A00360
                  * E. IF THE PROGRAM FAILS TO LOAO OR STOPS AT A    30A00370
                  *    WAIT 8ELOW AOORESS /0160 REFER TO THE         30A00380
                  *    RELOCATING LOADER OOCUMENTATION.              30A00390
                  *                                                  30A00400
                  * TO LOAO FROM PAPER TAPE.                         30A00410
                  *                                                  30A00420
                  * A. PLACE THE RELOCATING LOAOER IN THE READER.    30A00430
                  * B. MAKE READER READY.                            30A00440
                  * C. PRESS THE 1131 RESET KEY.                     30A00450
                  * O. PRESS THE 1131 PROGRAM LOAD KEY.              30A00460
                  * E. LOAOER WILL LOAO AND HALT AT WAIT 030F6 (BREG) 30A00470
                  * F. PLACE THE DISK ADJUST TEST IN THE READER.     30A00480
                  * G. MAKE READER READY.                            30A00490
                  * H. PRESS THE START KEY.                          30A00500
                  * I. IF THE PROGRAM FAILS TO LOAO OR STOPS AT A    30A00510
                  *    WAIT 8ELOW AOORESS /0160 REFER TO RELOCATING  30A00520
                  *    LOADER DOCUMENTATION.                         30A00530
                  *                                                  30A00540
                  *                                                  30A00550
3.1.1 SETUP       * A. AT WAIT O, ENTER DISK ORIVE AREA CODE         30A00560
                  *    IN CONSOLE SWITCHES O THRU 4 ANO CLEAR        30A00570
                  *    8ITS 5 THRU 14.                               30A00580
                  *                                                  30A00590
                  *                  ORIVE        8IT SW SETTING    30A00600
                  *                    0.................../2000     30A00610
                  *                    1.................../8800     30A00620
                  *                    2.................../9000     30A00630
                  *                    3.................../9800     30A00640
                  *                    4.................../A000     30A00650
                  *                                                  30A00660
                  * 8. WAIT ON TRACK ERROR.......SW 15.              30A00670
                  *      THIS SWITCH MAY BE CHANGEO AT ANY TIME.     30A00680
                  *                                                  30A00690
```



```
                  * C. DEPRESS START.                               30A00700
                  *                                                 30A00710
3.2 OPERATION     ************************************************* 30A00720
                  *                                                 30A00730
                  * THE PROGRAM WILL START OUT IN 20 MILL MODE.      30A00740
                  *                                                 30A00750
                  * THE ACCESS ARM IS FIRST RETURNED HOME.           30A00760
                  * THE ARM THEN SEEKS TO TRACK 2 WHERE SECTOR       30A00770
                  * ZERO IS READ AND COMPAREO WITH TRACK AODRESS 2.  30A00780
                  * A GOOD COMPARE CAUSES THE CONSOLE PRINTER        30A00790
                  * TO PRINT ONCE ANO THE ACCESS ARM TO GO TO        30A00800
                  * TRACK 200 WHERE THE SAME OPERATION IS REPEATEO   30A00810
                  * FOR TRACK 200. IF COMPARE AT TRACK 200 IS        30A00820
                  * SUCCESSFUL, THE PRINTER WILL PRINT ONCE AND      30A00830
                  * THE ACCESS ARM RETURNS TO TRACK 2 WHERE THE      30A00840
                  * A8OVE OPERATION WILL BE REPEATEO.                30A00850
                  *                                                 30A00860
                  * IF A COMPARE ERROR IS DETECTEO, THE PROGRAM      30A00870
                  * WILL COME TO A WAIT PROVIOED THAT SW 15 IS ON.   30A00880
                  * (SEE ERROR WAITS..(3.3)). IF SW 15 IS OFF        30A00890
                  * AND AN ERROR IS ENCOUNTERED, THE PROGRAM WILL    30A00900
                  * NOT CONTINUE ANO THE PRINTER WILL NOT PRINT.     30A00910
                  *                                                 30A00920
                  * TO STOP PROGRAM, OEPRESS IMMEOIATE STOP.         30A00930
                  *                                                 30A00940
                  * TO RESTART PROGRAM, OEPRESS STOP.                30A00950
                  *                                                 30A00960
                  * TO START PROGRAM, DEPRESS START.                 30A00970
                  *                                                 30A00980
                  * TO CHANGE FROM 20 MILL MODE OPERATION TO 10      30A00990
                  * MILL OPERATION, OR VICE VERSA PERFORM THE        30A01000
                  * FOLLOWING-                                      30A01010
                  *                                                 30A01020
                  *                  A. OEPRESS IMMEDIATE STOP.     30A01030
                  *                  8. DEPRESS PROGRAM RESET.      30A01040
                  *                  C. OEPRESS START.              30A01050
                  *                                                 30A01060
3.3 WAITS         ************************************************* 30A01070
                  *                                                 30A01080
     /3000        * ENTER DISK ORIVE AREA CODE. ( SEE 3.1.C )       30A01090
                  *                                                 30A01100
ERROR WAITS       ************************************************* 30A01110
                  *                                                 30A01120
     /30F1        * THE ADDRESS OF TRACK 2 - SECTOR ZERO WAS READ   30A01130
                  * AND FOUNO INVALIO.                              30A01140
                  *                                                 30A01150
                  * IF ACCESS ARM IS SITTING AT OETENT 2,           30A01160
                  * DEPRESS START TO CONTINUE AOJUSTMENT, ELSE      30A01170
                  * OO A SECTOR REWRITE AS FOLLOWS-                 30A01180
                  *          A. LOAD I REG TO /018C.                30A01190
                  *          8. PLACE CONSOLE SW IN RUN.            30A01200
                  *          C. OEPRESS START.                      30A01210
                  *                                                 30A01220
                  *             ************************************ 30A01230
                  *             ************** CAUTION ************** 30A01240
                  *             ************************************ 30A01250
                  *             *                                  * 30A01260
                  *             * ONLY USE TRACK 2 REWRITE OPTION  * 30A01270
                  *             * WHEN SITTING AT WAIT /30F1       * 30A01280
                  *             *                                  * 30A01290
                  *             * REWRITE OPTION WILL DESTROY      * 30A01300
                  *             * ORIGINAL SECTOR OATA.            * 30A01310
                  *             *                                  * 30A01320
                  *             ************************************ 30A01330
                  *                                                 30A01340
                  ************************************************* 30A01350
                  *                                                 30A01360
     /30F2        * THE ADDRESS OF TRACK 200 - SECTOR ZERO WAS READ 30A01370
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                    * AND FOUND INVALID.                                30A01380
                    *                                                   30A01390
                    * IF ACCESS ARM IS SITTING AT DETENT 200,           30A01400
                    * DEPRESS START TD CONTINUE ADJUSTMENT, ELSE        30A01410
                    * DD A SECTDR REWRITE AS FOLLOWS-                   30A01420
                    *          A. LDAD I REG TO /018F.                  30A01430
                    *          B. PLACE CONSOLE SW IN RUN.              30A01440
                    *          C. DEPRESS START.                        30A01450
                    *                                                   30A01460
                    *             ************************************  30A01470
                    *             *************** CAUTION **************  30A01480
                    *             ************************************  30A01490
                    *             *                                  *  30A01500
                    *             * ONLY USE TRACK 200 REWRITE OPTIDN *  30A01510
                    *             * WHEN SITTING AT WAIT /30F2       *  30A01520
                    *             *                                  *  30A01530
                    *             * REWRITE OPTION WILL DESTRDY      *  30A01540
                    *             * DRIGINAL SECTOR DATA.            *  30A01550
                    *             *                                  *  30A01560
                    *             ************************************  30A01570
                    *                                                   30A01580
3.4 TERMINATIDN     ***************************************************  30A01590
                    *                                                   30A01600
                    * TO TERMINATE PROGRAM DEPRESS IMMEDIATE STOP.      30A01610
                    *                                                   30A01620
4.0 PRINTOUTS       ***************************************************  30A01630
                    *                                                   30A01640
                    * NONE                                              30A01650
                    *                                                   30A01660
5.0 COMMENTS        ***************************************************  30A01670
                    *                                                   30A01680
                    * TO RERUN PROGRAM ON ANOTHER DRIVE, PRESS THE      30A01690
                    * STOP KEY AND THE PROGRAM WILL STOP AT WAIT 0      30A01700
                    * SEE SECTION 3.1.C                                 30A01710
                    *                                                   30A01720
                    ***************************************************  30A01730
                          ABS                                           30A01740
0160                      ORG     /0160                                 30A01750
                    *********************************************       30A01760
                    *                                           *       30A01770
                    *             DISK ADJUSTMENT PROGRAM       *       30A01780
                    *                                           *       30A01790
                    *********************************************       30A01800
                    *                                                   30A01810
0160 0 6500 01DE    BGN   LDX  L1 INT2       SET DISK INTERRUPT VECTOR  30A01820
0162 0 6D00 000A          STX  L1 /000A                                 30A01830
0164 0 6500 0170          LDX  L1 INT5       SET PROGRAM STOP VECTOR    30A01840
0166 0 6D00 000D          STX  L1 /000D                                 30A01850
0168 0 6500 01E2          LDX  L1 PRTIN      SET PRINTER VECTOR         30A01860
016A 0 6D00 000C          STX  L1 /000C                                 30A01870
                    *                                                   30A01880
016C 0 C84F         PROGM LDD     RESRT      *  SET AREA CODE IN        30A01890
016D 0 DC00 0000          STD   L 0          ** BIT SWITCHES            30A01900
016F 0 7002               MDX     WAIT       SKIP VECTOR                30A01910
                    *                                                   30A01920
0170 0 0000         INT5  DC      *-*        ENTRY POINT                30A01930
0171 0 084C               XIO     SPDSW      SENSE PROGRAM STOP         30A01940
                    *                                                   30A01950
0172 0 1010         WAIT  SLA     16         CLEAR ACC                  30A01960
0173 0 D06A               STO     INT2       CLEAR VECTOR               30A01970
0174 0 D06D               STO     PRTIN      CLEAR VECTOR               30A01980
0175 0 3000               DC      /3000      **                         30A01990
0176 0 7400 01DE          MDX   L INT2,0      TEST VECTOR FOR ZERO       30A02000
0178 0 70F9               MDX     WAIT       INTERRUPT OCCURRED         30A02010
0179 0 7400 01E2          MDX   L PRTIN,0    TEST VECTOR FOR ZERO       30A02020
017B 0 70F6               MDX     WAIT       INTERRUPT OCCURRED         30A02030
017C 0 4878               BOSC    +-Z        BRANCHOUT                  30A02040
017D 0 1000               NOP                FILL WORD                  30A02050
```



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                    *                                                   30A02060
017E 0 6210               LDX   2 16         *                          30A02070
017F 0 0858               XIO     RDSPS      **                         30A02080
0180 0 C068               LD      AREA       FETCH SW INPUT             30A02090
0181 0 E069               AND     F800       CLEAR BITS OTHER THAN AREA 30A02100
0182 0 D066               STO     AREA       SET AREA CODE              30A02110
0183 0 C600 01C5    AGAN1 LD    L2 SNDSW-1   * *                        30A02120
0185 0 E064               AND     H07FF                                 30A02130
0186 0 E862               DR      AREA       *  * SET AREA CODE         30A02140
0187 0 D600 01C5          STO   L2 SNDSW-1   *  * INTD IOCC             30A02150
0189 0 72FE               MDX   2 -2         * *                        30A02160
018A 0 70F8               MDX     AGAN1      **                         30A02170
018B 0 7005               MDX     SKHME      *                          30A02180
                    *                                                   30A02190
018C 0 083B         WTTWO XIO     WRT02      * WRITE ADDRESS AT         30A02200
018D 0 4060               BSI     TEST       * TRACK 2                  30A02210
018E 0 7002               MDX     SKHME      *                          30A02220
                    *                                                   30A02230
018F 0 083A         WTHND XIO     WRT20      * WRITE ADDRESS AT         30A02240
0190 0 405D               BSI     TEST       * TRACK 200                30A02250
                    *                                                   30A02260
0191 0 083C         SKHME XIO     HDME       * GO HDME                  30A02270
0192 0 405B               8SI     TEST       *                          30A02280
0193 0 083C               XIO     TRK2       ** GO TD TRACK             30A02290
0194 0 4059               8SI     TEST       ** 2                       30A02300
0195 0 7063               MDX     CHCK2      *                          30A02310
                    *                                                   30A02320
0196 0 C051         DNWDO LD      TOGGL      *                          30A02330
0197 0 4C20 019F          BSC   L ONWD1,Z    ** BR IF 10 MIL MODE       30A02340
0199 0 C02C               LD      SNDSW      * *                        30A02350
019A 0 D037               STO     TWHND      *  *                       30A02360
019B 0 D038               STO     TWO        *   *                      30A02370
019C 0 6201               LDX   2 1          *    *                     30A02380
019D 0 6301               LDX   3 1          *     * SET PROPER         30A02390
019E 0 7007               MDX     CMND1      *    *  MODE               30A02400
                    *                                                   30A02410
019F 0 6201         ONWD1 LDX   2 1          *    *                     30A02420
01A0 0 6A31               STX   2 TWHND      *  *                       30A02430
01A1 0 6A32               STX   2 TWO        * *                        30A02440
01A2 0 6680 01C6          LDX   I2 SNDSW                                30A02450
01A4 0 6780 01C6          LDX   I3 SNDSW                                30A02460
                    *                                                   30A02470
01A6 0 0828         CMND1 XIO     TWHND      *                          30A02480
01A7 0 4046               BSI     TEST       ** GO TO TRACK 200         30A02490
01A8 0 72FF               MDX   2 -1         **                         30A02500
01A9 0 70FC               MDX     CMND1      *                          30A02510
                    *                                                   30A02520
01AA 0 0821               XIO     READ       *                          30A02530
01AB 0 4042               BSI     TEST       **                         30A02540
01AC 0 C065               LD      INPUT&1    * *                        30A02550
01AD 0 F02F               EOR     OUT20&1    *  * READ/CDMPARE          30A02560
01AE 0 4C18 0184          BSC   L PRT1,+-    * *  ADDR AT TRK 200      30A02570
                    *                                                   30A02580
01B0 0 4005               BSI     RDSWT      TEST FOR SW 15             30A02590
01B1 0 4804               BSC     E          * *                        30A02600
01B2 0 30F2               DC      /30F2      **   ERROR, DID NOT        30A02610
01B3 0 70DD               MDX     SKHME      *    COMPARE               30A02620
                    *                                                   30A02630
01B4 0 4054         PRT1  BSI     TPRT       SPACE PRINTER              30A02640
01B5 0 703F               MDX     CMND2      CONTINUE                   30A02650
                    *                                                   30A02660
01B6 0 0000         RDSWT DC      *-*        ENTRY POINT                30A02670
01B7 0 081E               XIO     RDSPT      READ SWS                   30A02680
01B8 0 C033               LD      SWDAT      SET DATA TO ACC.           30A02690
01B9 0 4C80 01B6          BSC   I RDSWT      EXIT                       30A02700
                    *                                                   30A02710
                    *                                                   30A02720
01BC   0000               BSS   E                                       30A02730
```

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01BC 0 4C00 0205   RESRT 8SC  L  RSTRT      MODE CHANGE SET/UP          30A02740
01BE 0 0000        SPDSW DC                                             30A02750
018F 0 3F01              DC       /3F01     IOCC-SENSE RESET (5)        30A02760
01C0 0 01C2        PRTI1 DC       DATA      SPACE                       30A02770
01C1 0 0900              DC       /0900     PRINTER IOCC                30A02780
01C2 0 C400        DATA  DC       /C400     ZERO(TILT/ROTATE)           30A02790
01C3 0 0F00              DC       /0F00     SENSE AND NO RESET          30A02800
01C4 0 0000        SW1   DC       *-*       ERROR STOP SW.              30A02810
01C5 0 0F01              DC       /0F01     SENSE AND RESET             30A02820
01C6 0 00C6        SNDSW DC       198       CONSTANT 198                30A02830
01C7 0 0701              DC       /0701     IOCC-SENSE/RESET DSW        30A02840
01C8 0 01DA        WRT02 DC       OUT02                                 30A02850
01C9 0 0500              DC       /0500     IDCC-WRITE TRACK 2          30A02860
01CA 0 01DC        WRT20 DC       DUT20                                 30A02870
01C8 0 0500              DC       /0500     IOCC-WRITE TRACK 200        30A02880
01CC 0 0211        READ  DC       INPUT                                 30A02890
01CD 0 0600              DC       /0600     IDCC-REAO ADDRESS           30A02900
01CE 0 00CA        HOME  DC       202                                   30A02910
01CF 0 0404              DC       /0404     IDCC-SEEK HOME              30A02920
01D0 0 0002        TRK2  DC       2                                     30A02930
01D1 0 0400              DC       /0400     IOCC-GO TO TRK 2            30A02940
01D2 0 0000        TWHNO DC       *-*                                   30A02950
01D3 0 0400              DC       /0400     IDCC-GO TO TRK 200          30A02960
01D4 0 0000        TWO   DC       *-*                                   30A02970
01D5 0 0404              DC       /0404     IOCC-8ACK TO TRK 2          30A02980
01D6 0 01EC        RDSPT DC       SWDAT     READ SWITCHES               30A02990
01D7 0 3A00              DC       /3A00     IOCC                        30A03000
01D8 0 01E9        RDSPS DC       AREA                                  30A03010
01D9 0 3A00              DC       /3A00     IOCC-READ 8IT SWS           30A03020
01DA 0 0001        OUT02 DC       1         WRT TRK 2 TA8LE             30A03030
01D8 0 0010              DC       /0010     *                           30A03040
01DC 0 0001        OUT20 DC       1         WRT TRK 200 TA8LE           30A03050
01DD 0 0640              DC       /0640     *                           30A03060
                   *                                                    30A03070
01DE 0 0000        INT2  DC       *-*       *                           30A03080
01DF 0 08E6              XIO      SNDSW     ** DISK INTERRUPT           30A03090
01E0 0 4CC0 01DE         8OSC I   INT2      * RDUTINE                   30A03100
                   *                                                    30A03110
                   *                                                    30A03120
01E2 0 0000        PRTIN DC       *-*       ENTRY POINT                 30A03130
01E3 0 D009              STO      SAVE1     SAVE ACC.                   30A03140
01E4 0 08DF              XIO      SW1       SENSE AND RESET PRT.        30A03150
01E5 0 C007              LD       SAVE1     RESTORE ACC.                30A03160
01E6 0 4CC0 01E2         8OSC I   PRTIN     CLEAR INT.                  30A03170
                   *                                                    30A03180
                   *                                                    30A03190
01E8 0 0000        TOGGL OC       *-*       MOOE TOGGLE                 30A03200
01E9 0 0000        AREA  DC       *-*       CURRENT AREA COOE           30A03210
01EA 0 07FF        H07FF OC       /07FF                                 30A03220
01E8 0 F800        F800  DC       /F800     CLEAR WORD                  30A03230
01EC 0 0000        SWDAT DC       *-*       0ATA SWITCH INPUT AREA      30A03240
01ED 0 0000        SAVE1 OC       *-*       ACC SAVE AREA               30A03250
                   *                                                    30A03260
01EE 0 0000        TEST  DC       *-*       *                           30A03270
01EF 0 08D6              XIO      SNDSW     **                          30A03280
01F0 0 1800              SRA      13        * * CHECK FOR FILE          30A03290
01F1 0 4804              8SC      E         * * REAOY                   30A03300
01F2 0 70FC              M0X      TEST&1    **                          30A03310
01F3 0 4C80 01EE         8SC  I   TEST      *                           30A03320
                   *                                                    30A03330
01F5 0 08DE        CMND2 XIO      TWO       *                           30A03340
01F6 0 40F7              8SI      TEST      * GO TO TRACK 2             30A03350
01F7 0 73FF              MDX   3 -1         *                           30A03360
01F8 0 70FC              MDX      CMN02     *                           30A03370
                   *                                                    30A03380
01F9 0 08D2        CHCK2 XIO      REAO      *                           30A03390
01FA 0 40F3              8SI      TEST      **                          30A03400
01F8 0 C016              LD       INPUT&1   * *                         30A03410
```



```
01FC 0 F0DE              EDR      DUT02&1   *  * READ/COMPARE           30A03420
01FD 0 4C18 0203         8SC  L   PRT2,+-    * * ADDR AT TRK 2           30A03430
                   *                                                    30A03440
01FF 0 4086              8SI      RDSWT     TEST FOR SWITCH 15          30A03450
0200 0 4804              8SC      E         SKIP IF SW OFF              30A03460
0201 0 30F1              DC       /30F1     **   ERROR, DID NOT         30A03470
0202 0 708E              MDX      SKHME     *    COMPARE                30A03480
                   *                                                    30A03490
0203 0 4005        PRT2  BSI      TPRT      SPACE PRINTER               30A03500
0204 0 7091              MDX      ONWD0     CONTINUE                    30A03510
                   *                                                    30A03520
0205 0 C0E2        RSTRT LD       TOGGL     *                           30A03530
0206 0 F0D3              EOR      OUT02     ** CHANGE MODE              30A03540
0207 0 D0E0              STO      TOGGL     **                          30A03550
0208 0 7088              MDX      SKHME     *                           30A03560
                   *                                                    30A03570
0209 0 0000        TPRT  DC       *-*       ENTRY POINT                 30A03580
020A 0 0887              XIO      DATA      SENSE PRINTER               30A03590
0208 0 1005              SLA      5         MOVE LEFT                   30A03600
020C 0 4828              8SC      +Z        SKIP IF READY               30A03610
0200 0 70FC              MDX      TPRT+1    LOOP IF NOT READY           30A03620
020E 0 0881              XIO      PRTI1     SPACE PRINTER               30A03630
020F 0 4C80 0209         8SC  I   TPRT      EXIT                        30A03640
                   *                                                    30A03650
0211 0 0002        INPUT DC       2         INPUT AREA                  30A03660
0212   0002              8SS      2         *                           30A03670
0214   0160              END      8GN                                   30A03680
  NO STATEMENTS FLAGGED IN THE A8OVE ASSEMBLY
```

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AGAN1   0183  018A
AREA    01E9  0180 0182 0186 01D8
8GN     0160  0214
CHCK2   01F9  0195
CMND1   01A6  019E 01A9
CMND2   01F5  0185 01F8
DATA    01C2  01C0 020A
F800    01E8  0181
HOME    01CE  0191
H07FF   01EA  0185
INPUT   0211  01AC 01CC 01F8
INT2    01DE  0160 0173 0176 01E0
INT5    0170  0164
ONWD0   0196  0204
ONWD1   019F  0197
OUT02   01DA  01C8 01FC 0206
OUT20   01DC  01AD 01CA
PROGM   016C
PRTIN   01E2  0168 0174 0179 01E6
PRTI1   01C0  020E
PRT1    01B4  01AE
PRT2    0203  01FD
RDSPS   01D8  017F
RDSPT   01D6  0187
RDSWT   01B6  0180 0189 01FF
READ    01CC  01AA 01F9
RESRT   01BC  016C
RSTRT   0205  01BC
SAVE1   01ED  01E3 01E5
SKHME   0191  018B 018E 0183 0202 0208
SNDSW   01C6  0183 0187 0199 01A2 01A4 01DF 01EF
SPDSW   01BE  0171
SWDAT   01EC  0188 01D6
SW1     01C4  01E4
TEST    01EE  018D 0190 0192 0194 01A7 01AB 01F2 01F3 01F6 01FA
TOGGL   01E8  0196 0205 0207
TPRT    0209  0184 0203 020D 020F
TRK2    01D0  0193
TWHND   01D2  019A 01A0 01A6
TWO     01D4  0198 01A1 01F5
WAIT    0172  016F 0178 0178
WRT02   01C8  018C
WRT20   01CA  018F
WTHND   018F
WTTWO   018C
END OF ASSEM8LY
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TABLE OF CONTENTS

1. PURPOSE

ONE CARD PROGRAMS THAT PROVIDE THE C.E. WITH THE ABILITY TO EXERCISE VARIOUS FUNCTIONS OF THE 1130 SYSTEM. EACH CARD IS IDENTIFIED BY THE NUMBER IN COLUMNS 79 AND 80. THIS NUMBER REFERES TO A PARAGRAPH WITHIN THE APPENDIX.

2. REQUIREMENTS

THE C.E. MUST HAVE THE 1130 SYSTEM AND A MEANS TO ENTER THE PROGRAM.

3. USE PROCEDURE

3.1 SETUP AND OPERATION

CHECK EACH WRITE-UP FOR SWITCH SETTINGS BEFORE AND AFTER LOADING.

3.2 LOADING

THE PROGRAM IS LOADED IN IPL MODE FROM CARDS, PAPER TAPE OR MAY BE BIT-SWITCHED IN.

3.3 WAITS

WAITS ARE IDENTIFIED BY THE B-REGISTER. THEY HAVE THE FOLLOWING MEANING,

B-REG 3001 BIT SWITCH SETTINGS REQUIRED.

3002 ONE PASS OF THE PROGRAM HAS BEEN COMPLETED.

3003 NO INTERRUPT RECEIVED AFTER A WRITE COMMAND.

3004 NO INTERRUPT RECEIVED AFTER A READ COMMAND.

3005 NO INTERRUPT RECEIVED AFTER A CONTROL COMMAND.

3006 ERROR, SEE INDIVIDUAL PROGRAM.

3007 ERROR, SEE INDIVIDUAL PROGRAM.

3.4 TERMINATION

PRESS IMMEDIATE STOP. IF PROGRAM STOP IS PRESSED THE PROGRAM MAY NOT RUN BY PRESSING START BECAUSE INTERRUPT 5 IS ON.

3.5 RESTART

PRESS IMMEDIATE STOP AND RESET. PRELOADING SWITCHES MAY BE SET AS DESIRED. PRESS START. AT WAIT I MAKE REQUIRED BIT SWITCH SETTINGS.

4. PRINTOUTS

NONE EXCEPT FOR DEVICES THAT PRINT CHARCTERS ENTERED FROM THE BIT SWITCHES.

5. COMMENTS

IN MOST CASES A SPECIFIED 'LDX' MAY REPLACE A WAIT TO ALLOW RUNNING WITHOUT INTERRUPT. ERROR WAITS MAY BE REPLACED BY A 'NOP'. OTHER COMMENTS WILL BE FOUND IN EACH PROGRAM. AN INSTRUCTION FOLLOWED BY *A* WILL BE ALTERED. THIS IS DUE TO THE LIMITATIONS OF 1130 IPL MODE. THE ALTERED INSTRUCTION WILL FOLLOW THE *A*.

6. APPENDIX A

CHAR	1132	1403	KEY/8D	CON/PTR U/C	CON/PTR L/C
A	C1	64	A000	3E	3C
8	C2	25	8800	1A	18
C	C3	26	8400	1E	1C
D	C4	67	8200	32	30
E	C5	68	8100	36	34
F	C6	29	8080	12	10
G	C7	2A	8040	16	14
H	C8	68	8020	26	24
I	C9	2C	8010	22	20
J	D1	58	5000	7E	7C
K	D2	19	4800	5A	58
L	D3	1A	4400	5E	5C
M	D4	5B	4200	72	70
N	D5	1C	4100	76	74
O	D6	5D	4080	52	50
P	D7	5E	4040	56	54
Q	D8	1F	4020	66	64
R	D9	20	4010	62	60
S	E2	0D	2800	9A	98
T	F3	0E	2400	9E	9C
U	F4	4F	2200	82	80
V	E5	10	2100	86	84
W	E6	51	2080	92	90
X	E7	52	2040	96	94
Y	E8	13	2020	A6	A4
Z	E9	54	2010	A2	A0
0	F0	49	2000	C4	
1	F1	40	1000	FC	
2	F2	01	0800	D8	
3	F3	02	0400	DC	
4	F4	43	0200	F0	
5	F5	04	0100	F4	
6	F6	45	0080	D0	
7	F7	46	0040	D4	
8	F8	07	0020	E4	
9	F9	08	0010	E0	
=	7E	4A	00A0	C2	
$	58	62	4420	40	
.	48	6E	8420	00	
'	7D	0B	0120	E6	
,	6B	16	2420	80	
(	4D	57	8120	FE	
-	60	61	4000	84	
)	5D	2F	4120	F6	
+	4E	6D	80A0	DA	
/	61	4C	3000	8C	
*	5C	23	4220	D6	
&	50	15	8000	44	
SPACE	00	7F	0000	21	
NUM8ER			0420	C0	
AT			0220	04	
LS THN			8220	DE	
LOG/NOT			4060	F2	
SEM/CLM			40A0	D2	
QUOTE			0060	E2	
LOG/OR			8060	C6	
UNSCORE			2120	BE	
QST MK			2060	86	
COLON			0820	82	
GRT THN			20A0	46	
EXCLAIM			4820	42	
PERCENT			2220	06	
CENT			8820	02	
EOF			0008		
ER CHR			0004		
ER FLD			0002		
0-8-2			2820		

CONSOLE PRINTER CONTROLS
CARRIER RETURN
81
TA8
41
SPACE
21
BACK/SPACE
11
SHIFT TO RED
09
SHIFT TO 8LACK
05
LINE FEED
03

PLOTTER BIT SWITCH CONTROL — PAPER TAPE BIT SW CONTROL AND BINARY PATTERN DATA.

BIT SWS FUNCTION	PAPER TAPE BIT SW CONTROL AND BINARY PATTERN DATA.
0 AND 8 --- PEN DOWN	
1 AND 9 --- DRUM DOWN	
2 AND 10 -- DRUM UP	** ** * *
3 AND 11 -- CARR. RIGHT	* * * * * * * *
4 AND 12 -- CARR. LEFT	* * 0*. * * *
5 AND 13 -- PEN UP	*0 0 . * 0 *
SET CHAR. 1 IN BIT SWS 0-5	0 0 . *
SET CHAR. 2 IN BIT SWS 8-13	0 . 0 0 0 *
	0 . 0 0 *
	0 . 0 0 *
	0 . 0 *
	0 . 0 0 *
DECIMAL TO HEX CONVERSION TA8LE	0 . 0 *
	0 . *
	0 0 . 0 0 0 *
CYL NUMBER IN HEX / BIT SW SETTING IN HEX	0 0 . 0 0 *
	0 0 . 0 0 *
	0 0 . 0 *
10 0A	0 0 . 0 *
20 14	0 0 . 0 *
30 1E	0 0 . *
40 28	0 . 0 0 0 *
50 32	0 . 0 0 *
60 3C	0 . 0 0 *
70 46	0 . 0 *
80 50	0 . 0 0 *
90 5A	0 . 0 *
100 64	0 . 0 *
110 6E	0 . *
120 78	0 . 0 0 0 *
130 82	0 . 0 0 *
140 8C	0 . 0 0 *
150 96	0 . 0 *
160 A0	0 . 0 0 *
170 AA	0 . 0 *
180 B4	0 . 0 *
190 BE	0 . *
200 C8	. 0 0 0 *
	. 0 0 *
	. 0 0 *
	. 0 *
	. 0 0 *
	. 0 *
TO READ/COMPARE BINARY PATTERN, LOAD TAPE HERE	. 0 *
	. *
	. *
	. *
PAPER TAPE	*
CHANNEL -- 8 7 6 5 4 3 2 1	
CHAR 1 8IT SWS -- 0 1 2 3 4 5 6 7	
CHAR 2 8IT SWS -- 8 9 1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0

```
                *************************************************** 3A002440
                *                                                   3A002450
6. 1 STORAGE CHECK  *  EACH CORE LOCATION IS CHECKED WITH A PATTERN  3A002460
                *  SET IN THE BIT SWITCHES. IF BIT 14 IS ON THE BIT 3A002470
                *  SWITCHES ARE USED AS AN ADDRESS TO BE CHECKED    3A002480
                *  AND THE PATTERN IS /5555.                        3A002490
                *                                                   3A002500
    A. PRELOAD SWS  *  BIT SW 15- HALT AFTER ONE PASS.              3A002510
                *         14- USE ONE ADDRESS                       3A002520
                *          3-  4 K MEMORY                           3A002530
                *          2-  8 K                                  3A002540
                *          1- 16 K                                  3A002550
                *          0- 32 K                                  3A002560
                *                                                   3A002570
    B. LOADING      *  IPL MODE FROM CARDS OR PAPER TAPE.           3A002580
                *                                                   3A002590
    C. WAIT     1   *  SET PATTERN OR ADDRESS IN BIT SWITCHES.       3A002600
                *                                                   3A002610
                2   *  ONE PASS COMPLETED, PRESS START TO CONTINUE.  3A002620
                *                                                   3A002630
                6   *  PATTERN CHANGED. THE BIT THAT WAS DROPPED OR  3A002640
                *  PICKED IS ON IN THE ACCUMULATOR. FAILING ADDRESS 3A002650
                *  IS IN ADDRESS LOCATION 2. PRESS START TO         3A002660
                *  CONTINUE OR DO A RESTART.                        3A002670
                *                                                   3A002680
    D. RESTART      *  PRESS IMMEDIATE STOP AND RESET. PRELOADING    3A002690
                *  SWITCHES MAY BE SET AS DESIRED. PRESS START.     3A002700
                *                                                   3A002710
    E. COMMENTS     *  THIS PROGRAM WILL WRITE AND READ ALL CORE     3A002720
                *  ADDRESSES OUT SIDE THE PROGRAM AREA.             3A002730
                *  EACH ADDRESS IS WRITTEN AND CHECKED 2 TIMES.     3A002740
                *  IF AN ADDRESS IS FOUND TO BE A PROBLEM, SET BIT  3A002750
                *  14 ON AND RESTART. PLACE THE ADDRESS IN THE BIT  3A002760
                *  SWITCHES AT WAIT 1.                              3A002770
                *  THE PROGRAM WILL CHECK ONLY THAT ADDRESS WITH    3A002780
                *  THE PATTERN /5555.                               3A002790
                *                                                   3A002800
                *************************************************** 3A002810
                      ABS                                          3A002820
0000                  ORG    0                                     3A002830
0000 0 6009           LDX    STGST                                 3A002840
0001 0 0000 STGSW     DC     *-*        BIT SWITCH STG             3A002850
0002 0 0000 STGLC     DC     *-*        ADRS LOCATION              3A002860
0003 0 0000 STGPN     DC     *-*        STORAGE PATTERN            3A002870
0004 0 0000 STGCR     OC     *-*        SIZE OF CORE               3A002880
0005 0 0000 STGHL     DC     *-*        BIT 15- HALT               3A002890
                *                       BIT 14- USE 1 ADRS         3A002900
0006 0 0001 STGRD     DC     /0001                                 3A002910
0007 0 003A           DC     /003A   *A* DC     /3A00  RD BIT SW   3A002920
0008 0 0015 STGXX     DC     /0015      CONSTANT                   3A002930
0009 0 603F STGST     LDX    STG80   *A* LD     STGXX              3A002940
000A 0 1006           SLA    6          * PATTERN TO USE           3A002950
000B 0 E8EC           OR     STGXX      * UNLESS ALTERNATE         3A002960
000C 0 1006           SLA    6          * IS SELECTED              3A002970
000D 0 E8EA           OR     STGXX                                 3A002980
000E 0 D0F4           STO    STGPN                                 3A002990
000F 0 08F6           XIO    STGRD      READ BIT SWS               3A003000
0010 0 C0F0           LD     STGSW      GET BIT SW SETTINGS        3A003010
0011 0 D0F3           STO    STGHL      SET HALT IF B 15 ON        3A003020
0012 0 1802           SRA    2                                     3A003030
0013 0 1002           SLA    2                                     3A003040
0014 0 90F1           S      STGRD      ADJ CORE SIZE              3A003050
0015 0 D0FE           STO    STGCR      STORE CORE SIZE            3A003060
0016 0 3001           WAIT   1          SET SWS FOR PATTERN        3A003070
                *                       * OR ADDRESS               3A003080
0017 0 08FE           XIO    STGRD      READ BIT SWS               3A003090
0018 0 C0E8           LD     STGSW      GET BIT SW SETTINGS        3A003100
0019 0 18D0           RTE    16         * AND SAVE IN Q REG        3A003110
```



```
001A 0 C0EA           LD     STGHL      GET CNTL WORD              3A003120
001B 0 1801           SRA    1                                     3A003130
001C 0 4804           BSC    E          USE SWS AS ADRS            3A003140
001D 0 7003           MDX    STG7       * YES                      3A003150
001E 0 1800           RTE    16         * NO                       3A003160
001F 0 D0F3           STO    STGPN                                 3A003170
0020 0 70D2           MDX    STG0                                  3A003180
0021 0 1800     STG7  RTE    16                                    3A003190
0022 0 D0E1           STO    STGCR      SET ADRS IN CORE SIZE      3A003200
0023 0 C0E0     STGD  LD     STGCR      LD CORE SIZE               3A003210
0024 0 00D0           STO    STGLC      STORE IN XR 2              3A003220
0025 0 C0DD     STG1  LD     STGPN      LD PATTERN TO USE          3A003230
0026 0 00D2     STG2  DC     /0002   *A* TO STO   2 0             3A003240
0027 0 00C2           DC     /00C2   *A* TO LD    2 0             3A003250
0028 0 1000           NOP                                          3A003260
0029 0 E00C           EOR    STGRO      CHG BIT 15                 3A003270
002A 0 00D2     STG3  OC     /0002   *A* TO STO   2 0             3A003280
002B 0 00C2           OC     /00C2   *A* TO LO    2 0             3A003290
002C 0 E0D9           EOR    STGRD      CHG BIT 15 BACK            3A003300
002D 0 E0D5           EOR    STGPN      CK STARTING PATTERN        3A003310
002E 0 4820           BSC    Z          IS PATTERN THE SAME        3A003320
002F 0 3006           WAIT   6          * NO                       3A003330
0030 0 C0D4           LD     STGHL      * YES                      3A003340
0031 0 1801           SRA    1                                     3A003350
0032 0 4804           BSC    E          USE ONLY 1 ADRS            3A003360
0033 0 7006           MDX    STG10      * YES                      3A003370
0034 0 C0CD           LD     STGLC      * NO, GET ADRS             3A003380
0035 0 9000           S      STGRD      REDUCE ADRS                3A003390
0036 0 00CB           STO    STGLC      STORE IN XR 2              3A003400
0037 0 9006           S      STGPG      SUB PROG SIZE              3A003410
0038 0 4830           BSC    Z-         REACHED LAST ADRS          3A003420
0039 0 70EB           MDX    STG1       * NO                       3A003430
003A 0 C0CA     STG10 LD     STGHL      * YES                      3A003440
003B 0 4804           BSC    E          HALT PROGRAM               3A003450
003C 0 3002           WAIT   2          * YES                      3A003460
003D 0 70F5           MDX    STG0       * NO                       3A003470
003E 0 003E     STGPG DC     STGPG      LAST ADRS OF PROG          3A003480
                *                                                 3A003490
                *                INITIALIZATION ROUTINE           3A003500
                *                                                 3A003510
003F 0 C009     STGBD LD     STGSP                                 3A003520
0040 0 00C8           STO    STGST                                 3A003530
0041 0 C0C5           LD     STGRO+1    BUILD RD BIT SW IOCC       3A003540
0042 0 1008           SLA    8                                     3A003550
0043 0 00C3           STO    STGRD+1                               3A003560
0044 0 C8E1           LDD    STG2       BUILD STO AND LD           3A003570
0045 0 1808           RTE    24         * WITH XR 2                3A003580
0046 0 D8DF           STD    STG2                                  3A003590
0047 0 D8E2           STD    STG3                                  3A003600
0048 0 6009     STGRS LDX    STGST      GO TO PGM START            3A003610
0049 0 C0FF     STGSP LD   X STGXX-1-STGST                        3A003620
                ************************************************* 3A003630
004A 0 0000           DC     0          SPACE FILLER               3A003640
004B 0 0040           DC     /0040      THE LAST FIVE WORDS ARE    3A003650
004C 0 9000           DC     /9000      * USED FOR PROGRAM         3A003660
004D 0 2000           DC     /2000      * IDENTIFICATION. THREE    3A003670
004E 0 2000           DC     /2000      * FOR THE PID AND TWO FOR  3A003680
004F 0 1000           DC     /1000      * SEQUENCE.                3A003690
```

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                *************************************************** 3A003710
                *                                                     3A003720
6.02 CONSOLE    *  1. THE PROGRAM PRINTS ALTERNATE CHARACTERS OR     3A003730
     PRINTER    *     EXECUTES ALTERNATE CONTROL FUNCTIONS WHICH     3A003740
                *     HAVE BEEN SELECTED IN THE BIT SWITCHES.        3A003750
                *  2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE    3A003760
                *     DELAY BETWEEN XIO WRITE EXECUTIONS.            3A003770
                *  3. AN OPTION IS AVAILABLE TO HALT THE PROGRAM     3A003780
                *     AFTER THE COMPLETION OF THE EXECUTION OF       3A003790
                *     AN ALTERNATE XIO SEQUENCE.                     3A003800
                *                                                    3A003810
A. PRELOAD SWS  *  1. IF DELAY IS DESIRED, SET DELAY CONTROL        3A003820
                *     VALUE IN BIT SWITCHES 1 THRU 13.               3A003830
                *     *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY.        3A003840
                *            SWS 1 THRU 13 ALL OFF, NO DELAY.        3A003850
                *  2. IF A WAIT AFTER EACH PROGRAM PASS IS           3A003860
                *     DESIRED, TURN ON BIT SWITCH 15.                3A003870
                *                                                    3A003880
B. LOADING      *  LOAD IPL FROM CARD OR PAPER TAPE.                 3A003890
                *                                                    3A003900
C. WAITS     1  *  SET DESIRED CHAR/CONTROL CODES IN BIT SWITCHES    3A003910
                *  0 THRU 15. SEE PAGE 2 FOR BIT SW CODES.           3A003920
                *        1ST CHAR/CONTROL IN SWS 0 THRU 7.           3A003930
                *        2ND CHAR/CONTROL IN SWS 8 THRU 15.          3A003940
                *  DEPRESS START.                                    3A003950
                *                                                    3A003960
             2  *  NORMAL PROGRAM WAIT IF 1 PASS OPTION HAS BEEN     3A003970
                *  SELECTED. DEPRESS START TO MAKE ANOTHER PASS.      3A003980
                *                                                    3A003990
             3  *  NO INTERRUPT GENERATED AFTER XIO WRITE            3A004000
                *  COMMAND WAS GIVEN. SEE COMMENTS.                  3A004010
                *                                                    3A004020
0. RESTART      *  1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD    3A004030
                *     SWITCH SETTINGS, DEPRESS IMMEDIATE             3A004040
                *     STOP AND RESET PUSH BUTTONS.                   3A004050
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.       3A004060
                *  3. DEPRESS START.                                 3A004070
                *                                                    3A004080
E. COMMENTS     *  1. LAST OSW SENSED IS DISPLAYED IN THE Q REG.     3A004090
                *  2. IF PROGRAM LOOPS, CHECK Q REG FOR NOT RDY      3A004100
                *     OR BUSY OSW BITS BEING ON.                     3A004110
                *  3. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON      3A004120
                *     OR TO BYPASS THE INTERRUPT WAIT, LOAD /6020    3A004130
                *     INTO LOCATION /002A AND DO A PROGRAM RESTART.  3A004140
                *  4. TO SET UP LOOP TO EXECUTE XIO, LOAD /6020      3A004150
                *     INTO LOCATION /002A AND LOAD /1000 INTO        3A004160
                *     LOCATION /0031 AND DO A PROGRAM RESTART.       3A004170
                *                                                    3A004180
                *************************************************** 3A004190
                      ORG    0                                       3A004200
0000                                                                 3A004210
0000 0 6012     CP8GN LOX    CP8LO    *A* TO LOX  CPRDS /6024        3A004220
0001 0 0001     CPONE DC     1           CONSTANT ONE                3A004230
0002 0 0006     CP8SW DC     CPDSW       BIT SW SAVE AREA            3A004240
0003 0 003A           DC     /003A    *A* TO /3A00 RD 8IT SW         3A004250
0004 0 0006     CPWRT DC     CPOSW       CHARACTER ADDRESS           3A004260
0005 0 9000           DC     /9000    *A* TO /0900 XIO PRINT         3A004270
0006 0 0000     CPOSW DC     *-*         BIT SW READIN AREA          3A004280
0007 0 F010           DC     /F010    *A* TO /0F01 XIO SENSE         3A004290
0008 0 0000     CPSET DC     *-*         SW OPTION/DELAY SAVE        3A004300
0009 0 6010     CPCTL LDX    CPROS       2ND CHAR SW/RESET MOD       3A004310
000A 0 0000           DC     *-*                                     3A004320
000B 0 0000     CPDSV DC     *-*         DSW SAVE AREA               3A004330
000C 0 002C           DC     CPIN4       INTERRUPT ADDRESS           3A004340
000D 0 1810     CPALT SRA    16          CLR 2ND CHAR SW             3A004350
000E 0 00FA           STO    CPCTL       *                           3A004360
000F 0 7012           MDX    CPSEN       GO CHK IF PRINT BUSY        3A004370
0010 0 3002           WAIT   2           COMPLETED PROG PASS         3A004380
0011 0 700F           MDX    CPSEN-1     RESTART PROGRAM             3A004390
0012 0 C0F2     CP8LD LD     CPWRT&1     BUILD WRITE IOCC            3A004400
0013 0 1804           SRA    4           *                           3A004410
0014 0 D0F0           STO    CPWRT&1     *                           3A004420
0015 0 C0F1           LD     CPOSW&1     BUILD SENSE RESET           3A004430
0016 0 1804           SRA    4           * OSW IOCC                  3A004440
0017 0 00EF           STO    CPOSW&1     *                           3A004450
0018 0 C0EA           LD     CP8SW&1     BUILD READ BIT SW           3A004460
0019 0 1008           SLA    8           * IOCC                      3A004470
001A 0 00E8           STO    CP8SW&1     *                           3A004480
0018 0 C0ED           LD     CPCTL       SET UP RESET AND            3A004490
001C 0 00E3           STO    CP8GN       * START BRANCH              3A004500
0010 0 08E4     CPRDS XIO    CP8SW       READ BIT SWS FOR            3A004510
001E 0 C0E7           LD     CPOSW       * PROG OPTS/DELAY           3A004520
001F 0 D0E8           STO    CPSET       *                           3A004530
0020 0 3001           WAIT   1           SET CHARS IN SWS            3A004540
0021 0 08E0           XIO    CP8SW       READ BIT SWS                3A004550
0022 0 C8E7     CPSEN LDD    CPDSV-1     LOAD LAST OSW IN Q          3A004560
0023 0 08E2           XIO    CPDSW       CHK DEVICE NOT BUSY         3A004570
0024 0 00E6           STO    CPDSV       * OR NOT READY AND          3A004580
0025 0 1004           SLA    4           * SAVE OSW                  3A004590
0026 0 4820           BSC    Z           *                           3A004600
0027 0 70FA           MDX    CPSEN       *                           3A004610
0028 0 C8F1           LOD    CPDSV-1     LOAD LAST OSW IN Q          3A004620
0029 0 08DA           XIO    CPWRT       WRITE CHARACTER             3A004630
002A 0 3003           WAIT   3           WAIT FOR INTERUPT           3A004640
0028 0 7006           MDX    CPRET       BRANCH TO DELAY             3A004650
002C 0 0000     CPIN4 DC     *-*         INTERRUPT LEVEL 4           3A004660
0020 0 0808           XIO    CPOSW       SENSE RESET OSW             3A004670
002E 0 00DC           STO    CPDSV       SAVE OSW                    3A004680
002F 0 C8DB           LDD    CPDSV       LOAD DSW INTO Q REG         3A004690
0030 0 4850           BOSC   -           RESET INT LEVEL             3A004700
0031 0 70F8           MDX    CPIN4&1     RESENSE OSW                 3A004710
0032 0 C807     CPRET LOD    CPOSV-1     LOAD LAST OSW IN Q          3A004720
0033 0 C0D4           LD     CPSET       SET UP DELAY AND            3A004730
0034 0 1804           SRA    4           * EXECUTE DELAY             3A004740
0035 0 1003           SLA    3           *                           3A004750
0036 0 90CA     CPLOP S      CPONE       *                           3A004760
0037 0 4810           BSC    -           *                           3A004770
0038 0 70F0           MDX    CPLOP       *                           3A004780
0039 0 C0CC           LO     CPOSW       LO, SET UP 2ND CHAR         3A004790
003A 0 1008           SLA    8           *                           3A004800
003B 0 00CA           STO    CPOSW       *                           3A004810
003C 0 C0CC           LO     CPCTL       CHK IF 2ND CHAR SW          3A004820
003D 0 4820           BSC    Z           * OFF                       3A004830
003E 0 70CE           MDX    CPALT       NO, BRANCH                  3A004840
003F 0 68C9           STX    CPCTL       YES, SET 2ND CHAR SW        3A004850
0040 0 C0C7           LO     CPSET       CHK 1 PASS OPTION SW        3A004860
0041 0 4804           BSC    E           *                           3A004870
0042 0 70C0           MDX    CPALT&3     SW ON, GO TO WAIT 2         3A004880
0043 0 70DD           MDX    CPSEN-1     SW OFF, LOOP PROGRAM        3A004890
                *************************************************** 3A004900
0044 0 0000           DC     0           SPACE FILLER                3A004910
0045 0 0000           DC     0           *                           3A004920
0046 0 0000           DC     0           *                           3A004930
0047 0 0000           DC     0           *                           3A004940
0048 0 0000           DC     0           *                           3A004950
0049 0 0000           DC     0           *                           3A004960
004A 0 0000           DC     0           *                           3A004970
0048 0 0040           DC     /0040       THE LAST FIVE WORDS ARE     3A004980
004C 0 9000           DC     /9000       * USED FOR PROGRAM          3A004990
0040 0 2000           DC     /2000       * IDENTIFICATION. THREE     3A005000
004E 0 2000           DC     /2000       * FOR THE PIO AND TWO FOR   3A005010
004F 0 0800           DC     /0800       * SEQUENCE.
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IBM MAINTENANCE DIAGNOSTIC PROGRAM FOR THE 1130 SYSTEM
1130 SCOPE LOOP PROGRAMS

DATE 15FEB68 25JUL69
EC NO. 420403 571053

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                ************************************************** 3A005030
                *                                                  3A005040
6.03 KEYBOARD   *  1. THE PROGRAM SELECTS KEYBOARD AND DISPLAYS     3A005050
                *     THE CHARACTER READ OR THE DSW SENSED WHEN A  3A005060
                *     KEY IS DEPRESSED.                           3A005070
                *  2. THE PROGRAM ALSO CHECKS THE INTERRUPT REQUEST 3A005080
                *     KEY OPERATION.                              3A005090
                *  3. AN OPTION IS AVAILABLE TO HALT PROGRAM BEFORE 3A005100
                *     A KEY IS DEPRESSED, OR LOOP IN A SELECT     3A005110
                *     KEYBOARD AND SENSE DSW MODE.                3A005120
                *  4. SEE PAGE 2 FOR KEYBOARD CHAR CODES.          3A005130
                *                                                  3A005140
A. PRELOAD SWS  *  NONE, SWITCHES MAY BE CHANGED AT ANY TIME.      3A005150
                *                                                  3A005160
B. LOADING      *  LOAD IPL FROM CARD OR PAPER TAPE.               3A005170
                *                                                  3A005180
C. WAITS     1  *  SET DESIRED PROGRAM OPTIONS IN BIT SWS 14 AND 15.3A005190
                *        14 ON -- DISPLAY LAST CHAR READ IN Q REG. 3A005200
                *        14 OFF - DISPLAY LAST DSW IN Q REG.       3A005210
                *        15 ON -- WAIT AFTER EACH PROGRAM PASS.    3A005220
                *        15 OFF - LOOP IN SELECT KEYBOARD AND SENSE 3A005230
                *                 DSW MODE.                        3A005240
                *  DEPRESS START.                                  3A005250
                *                                                  3A005260
             2  *  NORMAL PROGRAM WAIT IF BIT SW 15 IS ON. SELECT  3A005270
                *  LIGHT SHOULD BE ON.                             3A005280
                *  LAST CHAR READ AND LAST DSW ARE DISPLAYED IN    3A005290
                *  ACCUMULATOR OR Q REG, DEPENDING ON BIT SW 14.   3A005300
                *  DEPRESS DESIRED KEYBOARD KEY OR DEPRESS INT. REQ.3A005310
                *                                                  3A005320
D. RESTART      *  1. TO RESTART PROGRAM, DEPRESS IMMEDIATE STOP   3A005330
                *     AND RESET PUSH BUTTONS.                     3A005340
                *  2. DEPRESS START.                               3A005350
                *                                                  3A005360
E. COMMENTS     *  1. LAST DSW SENSED OR LAST CHARACTER READ IS    3A005370
                *     DISPLAYED IN THE Q REG. SEE WAIT 1.         3A005380
                *  2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON,   3A005390
                *     EXECUTE BIT SW 15 OFF OPTION.               3A005400
                *                                                  3A005410
                ************************************************** 3A005420
0000                    ORG     0                                  3A005430
0000 0 6024     KYBGN LDX       KYBLD   *A* TO /6032 LOX KYRST     3A005440
0001 0 0001     KYONE DC        1          CONSTANT 1              3A005450
0002 0 0004     KYBSW DC        KYOSW      BIT SW SAVE AREA        3A005460
0003 0 003A           DC        /003A   *A* TO /3A00 RD BIT SWS    3A005470
0004 0 6032     KYOSW LOX       KYRST      RESET VECT/BIT SWS      3A005480
0005 0 F010           DC        /F010   *A* TO /0F01 XIO SENSE DSW 3A005490
0006 0 0000     KYSEL DC        0                                  3A005500
0007 0 C000           DC        /C000   *A* TO /0C00 XIO SEL KYBD  3A005510
0008 0 000A     KYRD  DC        KYKEY      KEYED RD/IN AREA        3A005520
0009 0 A000           DC        /A000   *A* TO /0A00 XIO KEY RD    3A005530
000A 0 0000     KYKEY DC        *-*        KEYED RD/IN AREA        3A005540
000B 0 0000     KYDSV DC        *-*        LAST DSW SENSED         3A005550
000C 0 0011           DC        KYIN4      INTERRUPT ADDR          3A005560
000D 0 C8FC     KYDCH LDD       KYKEY      LOAD LAST CHAR READ     3A005570
000E 0 1800           RTE       16         SWAP LAST CHAR/DSW      3A005580
000F 0 08FA           STO       KYKEY      *                       3A005590
0010 0 7011           MDX       KYDSP                              3A005600
0011 0 0000     KYIN4 DC        *-*        INTERRUPT ENTRY         3A005610
0012 0 08EF           XIO       KYBSW      READ BIT SWS            3A005620
0013 0 08F0           XIO       KYDSW      SENSE RESET DSW         3A005630
0014 0 00F6           STO       KYDSV      SAVE DSW                3A005640
0015 0 100I           SLA       1          CK IF RESPONSE          3A005650
0016 0 4850           BOSC      -          *                       3A005660
0017 0 7001           MDX       KYRFQ      NO, CHK IF RFQUEST      3A005670
0018 0 7003           MDX       KYRDW      YES, READ CHAR CODE     3A005680
0019 0 1001     KYREQ SLA       1          CHECK IF REQUEST        3A005690
001A 0 4850           BOSC      -          *                       3A005700
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001B 0 701A           MDX       KYSET      NO, RESENSE DSW         3A005710
001C 0 08EB     KYRDW XIO       KYRD       YES, READ LAST CHAR     3A005720
001D 0 08E8           XIO       KYSEL      SELECT KEYBOARD         3A005730
001E 0 C0F5           LD        KYDSW      CK IF CHAR/DSW IN Q     3A005740
001F 0 100F           SLA       14         *                       3A005750
0020 0 4828           BSC       &Z         *                       3A005760
0021 0 70FB           MDX       KYDCH      DISPLAY CHAR IN Q       3A005770
0022 0 C8E7     KYDSP LDD       KYKEY      DISPLAY DSW IN Q        3A005780
0023 0 7012           MDX       KYSET      GO SELECT KEYBOARD      3A005790
0024 0 C0DE     KYBLD LD        KYBSW&I    BUILD IOCCS AND         3A005800
0025 0 1008           SLA       8          * RESET/START VECT      3A005810
0026 0 00DC           STO       KYBSW&1    *                       3A005820
0027 0 C0DD           LD        KYDSW&1    *                       3A005830
0028 0 1804           SRA       4          *                       3A005840
0029 0 00DB           STO       KYDSW&1    *                       3A005850
002A 0 C0DC           LD        KYSEL&1    *                       3A005860
002B 0 1804           SRA       4          *                       3A005870
002C 0 00DA           STO       KYSEL&1    *                       3A005880
002D 0 C0DB           LD        KYRD&1     *                       3A005890
002E 0 1804           SRA       4          *                       3A005900
002F 0 00D9           STO       KYRD&1     *                       3A005910
0030 0 C0D3           LD        KYDSW      *                       3A005920
0031 0 00CE           STO       KYBGN      *                       3A005930
0032 0 3001     KYRST WAIT      1          SET PROGRAM OPTIONS     3A005940
0033 0 08D2           XIO       KYSEL      SELECT KEYBOARD         3A005950
0034 0 10I0           SLA       16         CL LAST CHAR KEYED      3A005960
0035 0 D004           STO       KYKEY      *                       3A005970
0036 0 08CB     KYSET XIO       KYBSW      RD BIT SWS FOR OPTS     3A005980
0037 0 C0CC           LD        KYDSW      CHK IF SEL/RD LOOP      3A005990
0038 0 100F           SLA       15         *                       3A006000
0039 0 4810           BSC       -          * OPTION IS SELECTED    3A006010
003A 0 70D7           MDX       KYIN4&1    YES, GO SENSE DSW       3A006020
003B 0 C8CE           LDD       KYKEY      DISPLAY CHAR/DSW IN Q   3A006030
003C 0 3002           WAIT      2          DEPRESS DESIRED KEY     3A006040
003D 0 70D4           MDX       KYIN4&1    GO SENSE DSW            3A006050
                ************************************************** 3A006060
003E 0 0000           DC        0          SPACE FILLER            3A006070
003F 0 0000           DC        0          *                       3A006080
0040 0 0000           DC        0          *                       3A006090
0041 0 0000           DC        0          *                       3A006100
0042 0 0000           DC        0          *                       3A006110
0043 0 0000           DC        0          *                       3A006120
0044 0 0000           DC        0          *                       3A006130
0045 0 0000           DC        0          *                       3A006140
0046 0 0000           DC        0          *                       3A006150
0047 0 0000           DC        0          *                       3A006160
0048 0 0000           DC        0          *                       3A006170
0049 0 0000           DC        0          *                       3A006180
004A 0 0000           DC        0          *                       3A006190
004B 0 0040           DC        /0040      THE LAST FIVE WORDS ARE 3A006200
004C 0 9000           DC        /9000      * USED FOR PROGRAM      3A006210
004D 0 2000           DC        /2000      * IDENTIFICATION. THREE 3A006220
004E 0 2000           DC        /2000      * FOR THE PIO AND TWO FOR 3A006230
004F 0 0040           DC        /0040      * SEQUENCE.             3A006240
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                *************************************************** 3A006260
                *                                                   3A006270
6.04 PAPER TAPE *  1. THE PROGRAM PUNCHES ALTERNATE CHARACTERS      3A0062B0
     PUNCH      *     WHICH HAS BEEN SELECTED IN THE BIT SWS,       3A006290
                *     OR A BINARY PATTERN.                          3A006300
                *  2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE   3A006310
                *     DELAY BETWEEN XIO PUNCH EXECUTIONS.           3A006320
                *  3. AN OPTION IS AVAILABLE TO HALT THE PROGRAM    3A006330
                *     AFTER THE COMPLETION OF THE EXECUTION OF      3A006340
                *     A PROGRAM PASS.                               3A006350
                *  4. SEE PAGE 2A FOR BIT SW CONTROL BINARY PATTERN.3A006360
                *  5. THIS TAPE MAY BE USED IN THE PAPER TAPE       3A006370
                *     READER SCOPE LOOP, 6.05.                      3A0063B0
                *                                                   3A006390
A. PRELOAD SWS  *  1. IF DELAY IS DESIRED, SET DELAY CONTROL       3A006400
                *     VALUE IN BIT SWITCHES 1 THRU 13.              3A006410
                *     *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY.       3A006420
                *            SWS 1 THRU 13 ALL OFF, NO DELAY.       3A006430
                *  2. IF A BINARY PATTERN IS DESIRED, TURN ON       3A006440
                *     BIT SWITCH 14.                                3A006450
                *  3. IF A WAIT AFTER EACH PROGRAM PASS IS          3A006460
                *     DESIRED, TURN ON BIT SWITCH 15.               3A006470
                *                                                   3A0064B0
B. LOADING      *  LOAD IPL FROM CARD OR PAPER TAPE.                3A006490
                *                                                   3A006500
C. WAITS      1 *  SET DESIRED CHARACTERS TO BE PUNCHED IN BIT SWS  3A006510
                *  0 THRU 15. SEE PAGE    FOR BIT SW CODES.         3A006520
                *        1ST CHARACTER IN SWS 0 THRU 7.             3A006530
                *        2ND CHARACTER IN SWS 8 THRU 15.            3A006540
                *  MAKE PAPER TAPE PUNCH READY.                     3A00655D
                *  DEPRESS START.                                   3A006560
                *                                                   3A006570
              2 *  NORMAL PROGRAM WAIT IF 1 PASS OPTION HAS BEEN    3A0065B0
                *  SELECTED. DEPRESS START TO MAKE ANOTHER PASS.     3A006590
                *                                                   3A006600
              3 *  NO INTERRUPT GENERATED AFTER XIO PUNCH           3A006610
                *  COMMAND WAS GIVEN. SEE COMMENTS.                 3A006620
                *                                                   3A006630
0. RESTART      *  1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD    3A006640
                *     SWITCH SETTINGS, DEPRESS IMMEDIATE            3A006650
                *     STOP AND RESET PUSH BUTTONS.                  3A006660
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.      3A006670
                *  3. DEPRESS START.                                3A006680
                *                                                   3A006690
E. COMMENTS     *  1. LAST DSW SENSED IS DISPLAYED IN THE Q REG.     3A006700
                *  2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON      3A006710
                *     OR TO BYPASS THE INTERRUPT WAIT, LOAD /6034   3A006720
                *     INTO LOCATION /0031 AND DO A PROGRAM RESTART. 3A006730
                *  3. TO SET UP LOOP TO EXECUTE XIO, LOAD /6034     3A006740
                *     INTO LOCATION /0031 AND LOAD /603A INTO       3A006750
                *     LOCATION /0039 AND DO A PROGRAM RESTART.      3A006760
                *                                                   3A006770
                *************************************************** 3A006780
0000                    ORG     0                                   3A006790
0000 0 600D     TPBGN   LDX     TPBLD   *A* TO LDX TPRDS /6024      3A006800
0001 0 0001     TPONE   DC      1       CONSTANT ONE                3A006810
0002 0 0006     TPBSW   DC      TPOSW   BIT SW SAVE AREA            3A006820
0003 0 003A             DC      /003A   *A* TO /3A00 RO BIT SWS     3A006830
0004 0 0006     TPWRT   DC      TPDSW   CHARACTER ADDRESS           3A006840
0005 D 0019             DC      /0019   *A* TO /1900 XIO PUNCH      3A006850
0006 0 DD00     TPOSW   DC      *-*     BIT SW READIN AREA          3A006860
0007 D 001F             DC      /0D1F   *A* TO /1FDI SENSE DSW      3A006870
0008 0 000D     TPSET   DC      *-*     SW OPTION/DELAY SAVE        3A006880
0009 0 6D1C     TPCTL   LDX     TPRDS   2ND CHAR SW/RESET MOD       3A006890
000A D 0000     TP1D0   DC      *-*     *A* TO /0100 PATT BUILD     3A006900
0DDB 0 0000     TPDSV   DC      *-*     OSW SAVE AREA               3A006910
000C 0 0033             DC      TPIN4   INTERRUPT ADDRESS           3A006920
000D 0 C0F7     TPBLD   LD      TPWRT&1 BUILD WRITE IOCC            3A006930
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000E 0 100B             SLA     B       *                           3A006940
000F 0 D0F5             STO     TPWRT&1 *                           3A006950
0010 0 C0F6             LD      TPDSW&1 BUILD SENSE RESET           3A006960
0011 0 100B             SLA     B       *                           3A006970
0012 0 EBEE             OR      TPONE   *                           3A006980
0013 0 D0F3             STO     TPDSW&1 *                           3A006990
0014 0 C0EE             LD      TPBSW&1 BUILD READ BIT SW           3A007000
0015 0 100B             SLA     8       * IOCC                      3A007010
0016 0 00EC             STO     TPBSW&1 *                           3A007020
0017 0 C0E9             LD      TPONE   BUILD PATTERN WORD          3A007030
001B 0 100B             SLA     B       *                           3A007040
0019 0 D0F0             STO     TP100   *                           3A007050
001A 0 C0EE             LD      TPCTL   SET UP RESET AND            3A007060
001B 0 D0E4             STO     TPBGN   * START BRANCH              3A007070
001C 0 0BE5     TPRDS   XIO     TPBSW   READ BIT SWS FOR            3A007080
001D 0 C0EB             LD      TPDSW   * PROG OPTS/DELAY           3A007090
001E 0 D0F9             STO     TPSET   *                           3A007100
001F 0 3001             WAIT    1       SET CHARS IN SWS            3A007110
0020 0 1010             SLA     16      CLR PUNCH WD LOC            3A007120
0021 0 D0E4             STO     TPDSW                               3A007130
0022 0 C0E5             LD      TPSET   CHK PUNCH OPTION            3A007140
0023 0 100E             SLA     14      *                           3A007150
0024 0 4B2B             BSC     &Z      *                           3A007160
0025 0 7002             MDX     TPPAT   BIT 14 ON, PCH PATT         3A007170
0026 0 0BDB             XIO     TPBSW   READ BIT SWS                3A007180
0027 0 7005             MDX     TPSEN   GO SENSE OSW                3A007190
0028 0 C0DD     TPPAT   LD      TPDSW   LOAD PATTERN WORD           3A007200
0029 0 B0E0             A       TP100   BUILD NEXT WORD             3A007210
002A 0 D0DB             STO     TPDSW   *                           3A007220
002B 0 1010     TPALT   SLA     16      CLR 2ND CHAR SW             3A007230
002C 0 D0DC             STO     TPCTL   *                           3A007240
002D 0 0BD8     TPSEN   XIO     TPDSW   SENSE DSW                   3A007250
002E 0 D0DC             STO     TPDSV   SAVE DSW                   3A007260
002F 0 CBDA             LDD     TPDSV-1 LOAD LAST OSW IN Q          3A007270
0030 0 0BD3             XIO     TPWRT   PUNCH CHARACTER             3A007280
0031 0 3003             WAIT    3       WAIT FOR INTERUPT           3A007290
0032 0 7007             MDX     TPRET   BRANCH TO DELAY             3A007300
0033 0 0000     TPIN4   DC      *-*     INTERRUPT LEVEL 4           3A007310
0034 0 CBD5             LDD     TPDSV-1 LOAD LAST DSW INTO Q        3A007320
0035 0 0BD0             XID     TPDSW   SENSE RESET DSW             3A007330
0036 0 D0D4             STD     TPDSV   SAVE DSW                    3A007340
0037 0 1003             SLA     3       CK IF PUNCH RESPONSE        3A007350
003B 0 4B50             BOSC    -       RESET INT LEVEL             3A007360
0039 0 70FA             MDX     TPIN4&1 RESENSE DSW                 3A007370
003A 0 C0CD     TPRET   LD      TPSET   SET UP DELAY AND            3A007380
003B 0 1B01             SRA     1       * EXECUTE DELAY             3A007390
003C 0 90C4     TPLOP   S       TPONE   *                           3A007400
003D 0 4B10             BSC     -       *                           3A007410
003E 0 70FD             MDX     TPLOP   *                           3A007420
003F 0 C0C9             LD      TPCTL   CHK IF 2ND CHAR SW          3A007430
0040 0 4B1B             BSC     &-      * CLEARED                   3A007440
0041 0 7004             MDX     TPNOT   YES                         3A007450
0042 0 C0C3             LD      TPDSW   NO, SET UP 2ND CHAR         3A007460
0043 0 100B             SLA     B       *                           3A007470
0044 0 D0C1             STO     TPDSW   *                           3A007480
0045 0 70E5             MDX     TPALT   PUNCH 2ND CHAR              3A007490
0046 0 6BC2     TPNOT   STX     TPCTL   SET 2ND CHAR SW             3A007500
0047 0 C0C0             LD      TPSET   CHK 1 PASS OPTION SW        3A007510
004B 0 4B04             BSC     E       *                           3A007520
0049 0 3002             WAIT    2       COMPLETED PROG PASS         3A007530
004A 0 70D7             MDX     TPRDS&6 LOOP PROGRAM                3A007540
                ********************************************************* 3A007550
004B 0 0040             DC      /0040   THE LAST FIVE WORDS ARE     3A007560
004C 0 9000             DC      /9000   * USED FOR PROGRAM          3A007570
004D 0 200D             DC      /2000   * IDENTIFICATION. THREE     3A007580
004E 0 200D             DC      /2000   * FOR THE PID AND TWO FOR   3A007590
004F 0 0020             DC      /0020   * SEQUENCE.                 3A007600
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                *************************************************** 3A007620
6.05 PAPER TAPE *  1. THE PROGRAM READS CHARACTERS WHICH HAVE BEEN   3A007630
     READER     *     PUNCHED IN THE TAPE AND COMPARES THEM WITH     3A007640
                *     A BINARY PATTERN OR ALTERNATE BIT SWITCH       3A007650
                *     CHARACTERS.                                    3A007660
                *  2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE    3A007670
                *     DELAY BETWEEN X10 READ EXECUTIONS.             3A007680
                *  3. AN OPTION IS AVAILABLE TO BYPASS WAIT 6        3A007690
                *     ON COMPARE ERRORS.                             3A007700
                *                                                    3A007710
A. PRELOAD SWS  *  1. IF DELAY IS DESIRED, SET DELAY CONTROL        3A007720
                *     VALUE IN BIT SWITCHES 1 THRU 13.               3A007730
                *     *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY.        3A007740
                *            SWS 1 THRU 13 ALL OFF, NO DELAY.        3A007750
                *  2. IF A BINARY PATTERN IS DESIRED, TURN ON        3A007760
                *     BIT SWITCH 14.                                 3A007770
                *  3. IF BYPASS COMPARE ERROR WAIT 6 OPTION IS       3A007780
                *     DESIRED, TURN ON BIT SWITCH 15.                3A007790
                *                                                    3A007800
B. LOADING      *  LOAD IPL FROM CARD OR PAPER TAPE.                 3A007810
                *                                                    3A007820
C. WAITS     1  *  LOAD PAPER TAPE INTO READER. SEE PAGE 2A FOR     3A007830
                *  LOADING A BINARY PATTERN TAPE.                    3A007840
                *  PLACE 1ST CHARACTER TO BE READ FROM THE TAPE,     3A007850
                *  JUST BEHIND SENSING PINS.                         3A007860
                *  SET DESIRED CHARACTERS TO COMPARE IN BIT SWS      3A007870
                *  0 THRU 15. SEE PAGE 2A FOR BIT SW CODES.          3A007880
                *        1ST CHARACTER IN SWS 0 THRU 7.              3A007890
                *        2ND CHARACTER IN SWS 8 THRU 15.             3A007900
                *  DEPRESS START.                                    3A007910
                *                                                    3A007920
             5  *  NO INTERRUPT GENERATED AFTER XIO TAPE ADVANCE     3A007930
                *  COMMAND WAS GIVEN. SEE COMMENTS.                  3A007940
                *                                                    3A007950
             6  *  COMPARE ERROR. ACCUMULATOR CONTAINS THE CHAR      3A007960
                *  READ. THIS CHARACTER IS NOW LOCATED 1 CHARACTER   3A007970
                *  PAST THE SENSING PINS.                            3A007980
                *  TO READ/COMPARE NEXT CHARACTER, DEPRESS START.    3A007990
                *  TO LOOP ON COMPARE ERROR, SEE PRELOAD SWS.        3A008000
                *                                                    3A008010
D. RESTART      *  1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD    3A008020
                *     SWITCH SETTINGS, DEPRESS IMMEDIATE             3A008030
                *     STOP AND RESET PUSH BUTTONS.                   3A008040
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.       3A008050
                *  3. DEPRESS START.                                 3A008060
                *                                                    3A008070
E. COMMENTS     *  1. LAST OSW SENSED IS DISPLAYED IN THE Q REG.     3A008080
                *  2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON      3A008090
                *     OR TO BYPASS THE INTERRUPT WAIT, LOAD /6002    3A008100
                *     INTO LOCATION /0042 AND 00 A PROGRAM RESTART.  3A008110
                *  3. TO SET UP LOOP TO EXECUTE XIO, LOAD /6002      3A008120
                *     INTO LOCATION /0042 AND LOAD /601A INTO        3A008130
                *     LOCATION /0006 AND DO A PROGRAM RESTART.       3A008140
0000                    ORG     0                                   3A008150
0000 0 6021     TRBGN   LDX     TRBLD   *A* TO /602F LDX TRRST      3A008160
0001 0 602F     TRINT   LDX     TRRST       INTERRUPT ENTRY         3A008170
0002 0 0809             XIO     TROSW       SENSE OSW               3A008180
0003 0 D021             STO     TRDSV       SAVE DSW                3A008190
0004 0 1001             SLA     1           CK FOR OP COMPLETE      3A008200
0005 0 4850             BOSC    -           *                       3A008210
0006 0 70F8             MDX     TRINT&1     NO, RESENSE OSW         3A008220
0007 0 0806             XIO     TRRD        YES, READ TAPE          3A008230
0008 0 C01B             LD      TRARA       COMPARE TO EXPECTED     3A008240
0009 0 7008             MDX     TRI4A       GO TO TRI4A             3A008250
000A 0 D000     TRADV   DC      /0000       BUILD CONSTANT          3A008260
000B 0 F000             DC      /F000   *A* TO /1C00 XIO ADVANCE    3A008270
000C 0 0001     TROSW   DC      /0001       INT ADR/CONSTANT 1      3A008280
000D 0 F808             OC      /F808   *A* TO /1F01 XIO SENSE      3A008290
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000E 0 0024     TRRD    OC      TRARA       READ/IN ADDR            3A008300
000F 0 001A             OC      /001A   *A* TO /1A00 XIO READ       3A008310
0010 0 0023     TR8SW   DC      TRSBW       BIT SW SAVE ADDR        3A008320
0011 0 003A             OC      /003A   *A* TO /3A00 RD 8IT SWS     3A008330
0012 0 F010     TRI4A   FOR     TRSBW       *                       3A008340
0013 0 4818             BSC     &-          *                       3A008350
0014 0 7005             MDX     TRLOP-3     OK, GO TO DELAY         3A008360
0015 0 C008             LD      TRBLD       ERR, CK LOOP/ERR OPT    3A008370
0016 0 4804             BSC     E           *                       3A008380
0017 0 7002             MDX     TRLOP-3     LOOP/ERR SELECTED       3A008390
0018 0 C80B             LDD     TRARA       LD WD READ AND DSW      3A008400
0019 0 3006             WAIT    6           COMPARE ERROR WAIT      3A008410
001A 0 C809             LDD     TRARA       LOAD DSW INTO Q         3A008420
001B 0 C005             LD      TRBLD       SET UP DELAY            3A008430
001C 0 1801             SRA     1           *                       3A008440
001D 0 90EF     TRLOP   S       TRDSW       *                       3A008450
001E 0 4810             BSC     -           *                       3A008460
001F 0 70FD             MDX     TRLOP       *                       3A008470
0020 0 7014             MDX     TRSTR       CK ON PATT OPT          3A008480
0021 0 C0EF     TRBLD   LD      TRBSW&1     BUILD PROGRAM           3A008490
0022 0 1008     TR100   SLA     8       *A* TO /0100 PATT. BUILD    3A008500
0023 0 00E0     TRSBW   STO     TRBSW&1 *A* TO *-* COMP S/8 WORD    3A008510
0024 0 C0F8     TRARA   LD      TRDSW&1 *A* TO *-* WORD READ        3A008520
0025 0 1803     TRDSV   SRA     3       *A* TO *-* SAVED DSW        3A008530
0026 0 D0E6     TRCTL   STO     TRDSW&1 *A* TO *-* ALT CHAR SW      3A008540
0027 0 1008             SLA     8           *                       3A008550
0028 0 00F9             STO     TR100       *                       3A008560
0029 0 C8E0             LDD     TRADV       *                       3A008570
002A 0 19C3             RTE     3           *                       3A008580
002B 0 00E3             STO     TRRD&1      *                       3A008590
002C 0 080D             STO     TRADV       *                       3A008600
002D 0 C0D3             LD      TRIN4       *                       3A008610
002E 0 D0D1             STO     TRBGN       *                       3A009620
002F 0 08E0     TRRST   XIO     TRBSW       RD SWS DELAY/OPTIONS    3A008630
0030 0 C0F2             LD      TRSBW       SAVE DELAY/OPTIONS      3A008640
0031 0 D0EF             STO     TRBLD       *                       3A008650
0032 0 3001             WAIT    1           SET CHARACTERS IN SWS   3A008660
0033 0 1010             SLA     16          INITIALIZE S/8 WD       3A008670
0034 0 00EE             STO     TRSBW       *                       3A008680
0035 0 C0EB     TRSTR   LD      TRBLD       CK WHICH PATT OPTION    3A008690
0036 0 100E             SLA     14          *                       3A008700
0037 0 4828             BSC     &Z          *                       3A008710
0038 0 700F             MDX     TRPAT       BINARY PATT SELECTED    3A008720
0039 0 08D6             XIO     TRBSW       READ BIT SWS-CHARS      3A008730
003A 0 C0EB             LD      TRCTL       CK WHICH CHAR           3A008740
003B 0 4820             BSC     Z           *                       3A008750
003C 0 7006             MDX     TRNOT       SEL LEFT CHAR           3A008760
003D 0 68F8             STX     TRCTL       SET ALT CHAR SW         3A008770
003E 0 C0E4             LD      TRSBW       LOAD BIT SWS            3A008780
003F 0 1008     TRALT   SLA     8           SET UP RIGHT CHAR       3A008790
0040 0 D0E2             STO     TRSBW       SAVE IN S/B             3A008800
0041 0 08C8             XIO     TRADV       ADVANCE TAPE            3A008810
0042 0 3005             WAIT    5           WAIT FOR INTERRUPT      3A008820
0043 0 1010     TRNOT   SLA     16          CL ALT CHAR SW          3A008830
0044 0 00E1             STO     TRCTL       *                       3A008840
0045 0 C000             LD      TRSBW       SET UP RIGHT CHAR       3A008850
0046 0 1808             SRA     8           *                       3A008860
0047 0 70F7             MDX     TRALT       *                       3A008870
0048 0 C0DA     TRPAT   LD      TRSBW       SET UP BINARY PATT      3A008880
0049 0 8008             A       TR100       *                       3A008890
004A 0 70F5             MDX     TRALT&1     *                       3A008900
                ********************************************************3A008910
004B 0 0040             DC      /0040       THE LAST FIVE WORDS ARE 3A008920
004C 0 9000             DC      /9000       * USED FOR PROGRAM      3A008930
004D 0 2000             DC      /2000       * IDENTIFICATION. THREE 3A008940
004E 0 2000             DC      /2000       * FOR THE PID AND TWO FOR3A008950
004F 0 0010             DC      /0010       * SEQUENCE.             3A008960
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                *************************************************** 3A008980
                *                                                     3A008990
6.06 1442 PUNCH *  THIS PROGRAM WILL PUNCH THE DATA IN BIT SWITCHES  3A009000
                *  0-11 IN ALL COLUMN UNLESS BIT 12 IS ON AND THEN   3A009010
                *  ONLY THE FIRST COLUMN IS PUNCHED. THESE CARDS     3A009020
                *  MAY BE USED IN THE READER SCOPE LOOP 6.07 AND     3A009030
                *  6.11.                                             3A009040
                *                                                    3A009050
   A. PRELOAD SWS *  NONE, SWITCHES MAY BE SET AT ANY TIME.         3A009060
                *                                                    3A009070
   B. LOADING   *  IPL MODE FROM CARDS OR PAPER TAPE.               3A009080
                *                                                    3A009090
   C. WAIT     1*  SET DESIRED BIT SWITCHES AS FOLLOWS,             3A009100
                *                    BIT 15- HALT                    3A009110
                *                    BIT 14- STACKER SELECT          3A009120
                *                    BIT 13- FEED A CARD             3A009130
                *                    BIT 12- TERMINATE PUNCHING      3A009140
                *                  0 TO 11- PUNCHING PATTERN         3A009150
                *                                                    3A009160
              2 *  ONE PASS COMPLETED, PRESS START TO CONTINUE.      3A009170
                *                                                    3A009180
              3 *  LOST PUNCH INTERRUPT.                            3A009190
                *                                                    3A009200
              5 *  LOST FEED OR INTIATE PUNCH INTERRUPT.            3A009210
                *                                                    3A009220
   D. RESTART   *  PRESS IMMEDIATE STOP AND RESET. PRELOADING       3A009230
                *  SWITCHES MAY BE SET AS DESIRED. PRESS START.      3A009240
                *                                                    3A009250
   E. COMMENTS  *  1. TO RUN THE PROG WITH INTERRUPT DELAY SWITCH    3A009260
                *     ON OR BYPASS THE INTERRUPT WAIT LOAD /6012     3A009270
                *     INTO LOCATION /0021 AND /0032 AND RESTART.     3A009280
                *                                                    3A009290
                *  2. TO GET A FASTER LOOP THAN THE ABOVE PLACE      3A009300
                *     /70FF IN THE NEXT LOCATION AFTER THE XIO. THE  3A009310
                *     XIO WILL BE EXECUTED AFTER EACH BRANCH.        3A009320
                *                                                    3A009330
                *************************************************** 3A009340
0000                    ORG     0                                   3A009350
0000 0 6037 PHFED LOX   PHBLO   *A* TO /600F  LDX    PH1            3A009360
0001 0 0003       OC    /0003   *A* OC     /1402 FD A CO            3A009370
0002 0 0000 PHCTR OC    *-*        COLUMN COUNTER                   3A009380
0003 0 0000 PHSWS OC    *-*        8IT SWITCH STG                   3A009390
0004 0 0003 PHBSW DC    /0003      READ IN ADRS                     3A009400
0005 0 003A       DC    /003A   *A* DC     /3A00                    3A009410
0006 0 0003 PHPCH OC    PHSWS      PCH I/O AREA                     3A009420
0007 0 0011       DC    /0011   *A* DC     /1100                    3A009430
0008 0 0011 PHPST DC    PHINT      COL INTR ADRS                    3A009440
0009 0 A008       OC    /A008   *A* DC     /1401                    3A009450
000A 0 0008 PHOSW DC    /0008      PCH TERMINATOR                   3A009460
000B 0 B818       OC    /B818   *A* DC     /1703                    3A009470
000C 0 0011 PHSTK DC    PHINT      OP COMP INTR ADRS                3A009480
000D 0 0029       DC    /0029   *A* OC     /1480                    3A009490
000E 0 00F0 PHK50 DC    /00F0      80 COLS TIMES 3                  3A009500
000F 0 3001 PH1   WAIT  1          SET BIT SWS                      3A009510
0010 0 701E       MOX   PH2                                         3A009520
0011 0 0000 PHINT DC    *-*        INTERREPT ENTRY                  3A009530
0012 0 08F7       XIO   PHDSW      SENSE DSW                        3A009540
0013 0 1001       SLA   1                                           3A009550
0014 0 4850       BOSC  -          COL INTR ON                      3A009560
0015 0 700C       MOX   PH6        * NO, TRY OP COMP                3A009570
0016 0 08ED       XIO   PHBSW                                       3A009580
0017 0 C0EA       LD    PHCTR      COLUMN COUNTER                   3A009590
0018 0 80EB       A     PH8SW      ADD THREE                        3A009600
0019 0 D0E8       STO   PHCTR                                       3A009610
001A 0 E0F3       FOR   PHK50      CHECK FOR LAST COLUMN            3A009620
001B 0 4820       BSC   Z          IS IT LAST COLUMN                3A009630
001C 0 7003       MOX   PH4                                         3A009640
001D 0 C0E5       LD    PHSWS      GET DATA TO BE PUNCHED           3A009650
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001E 0 E8EB       OR    PHDSW      * AND OR IN PCH TERM             3A009660
001F 0 00E3       STO   PHSWS      * ANS STORE BACK                 3A009670
0020 0 08E5 PH4   XIO   PHPCH      PUNCH A COLUMN                   3A009680
0021 0 3003       WAIT  3          WAIT FOR INTERRUPT               3A009690
0022 0 1003 PH6   SLA   3                                           3A009700
0023 0 4850       BOSC  -          OP COMP ON                       3A009710
0024 0 6012       LDX   PHINT&1    * NO, SENSE AGAIN                3A009720
0025 0 1010       SLA   16         * LEVEL 4- OP COMP               3A009730
0026 0 000B       STO   PHCTR      CLEAR COLUMN COUNTER             3A009740
0027 0 08DC       XIO   PH8SW      READ 8IT SWITCHES                3A009750
0028 0 C0DA       LD    PHSWS      GET SW SETTING                   3A009760
0029 0 4804       BSC   E          HALT PROGRAM                     3A009770
002A 0 3002       WAIT  2          * YES                            3A009780
002B 0 1801       SRA   1          * NO                             3A009790
002C 0 4804       BSC   E          DO STACKER SELECT                3A009800
002D 0 7005       MOX   PH8        * YES                            3A009810
002E 0 1801       SRA   1          * NO                             3A009820
002E 0 4804       BSC   E          WHAT OPERATION                   3A009830
0030 0 08CF PH2   XIO   PHFED      FEED A CARD                      3A009840
0031 0 0806       XIO   PHPST      START THE PUNCH                  3A009850
0032 0 3005       WAIT  5          * PCH FROM SWS                   3A009860
0033 0 0808 PH8   XIO   PHSTK      GIVE STACKER COMMAND             3A009870
0034 0 C0CE       LD    PHSWS      RESTORE ACC                      3A009880
0035 0 1802       SRA   2                                           3A009890
0036 0 70F8       MOX   PH2-1                                       3A009900
                  *                BUILD XIO COMMANDS               3A009910
0037 0 C012 PHBLD LD    PHRES      SET UP RESTART                   3A009920
0038 0 00C7       STO   0                                           3A009930
0039 0 C0CF       LD    PHPST+1    * INIT PCH                       3A009940
003A 0 1803       SRA   3          *                                3A009950
003B 0 00C0       STO   PHPST+1    *                                3A009960
003C 0 F0C4       EOR   PHFED&1    * FEED A CARD                    3A009970
003D 0 00C3       STO   PHFED&1    *                                3A009980
003E 0 C0C6       LD    PH8SW+1    * READ BIT SWITCHES              3A009990
003F 0 1008       SLA   8          *                                3A010000
0040 0 00C4       STO   PH8SW+1    *                                3A010010
0041 0 C0C9       LD    PHDSW+1    * SENSE DSW                      3A010020
0042 0 1803       SRA   3          *                                3A010030
0043 0 00C7       STO   PHDSW+1    *                                3A010040
0044 0 C0C2       LD    PHPCH+1    * PCH A COLUMN                   3A010050
0045 0 1008       SLA   8          *                                3A010060
0046 0 D0C0       STO   PHPCH+1    *                                3A010070
0047 0 C0C5       LD    PHSTK+1    * STACK SELECT                   3A010080
0048 0 1007       SLA   7          *                                3A010090
0049 0 D0C3       STO   PHSTK&1    *                                3A010100
004A 0 600F PHRES LDX   PH1                                       3A010110
                *************************************************** 3A010120
0048 0 0040       DC    /0040      THE LAST FIVE WORDS ARE          3A010130
004C 0 9000       DC    /9000      * USED FOR PROGRAM               3A010140
004D 0 2000       DC    /2000      * IDENTIFICATION. THREE          3A010150
004E 0 2000       DC    /2000.     * FOR THE PID AND TWO EOR        3A010160
004F 0 0008       DC    /0008      * SEQUENCE.                      3A010170
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                *****************************************************  3A010190
                *                                                       3A010200
6.07 1442 READER*  1. THE PROGRAM READS A COLUMN OF DATA FROM          3A010210
                *     THE CARD AND COMPARES IT WITH THE BIT SWS.       3A010220
                *  2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE      3A010230
                *     DELAY BETWEEN XIO READ EXECUTIONS.               3A010240
                *  3. AN OPTION IS AVAILABLE TO BYPASS WAIT 6          3A010250
                *     ON COMPARE ERRORS.                               3A010260
                *                                                      3A010270
A. PRELOAD SWS  *  1. IF DELAY IS DESIRED, SET DELAY CONTROL          3A010280
                *     VALUE IN BIT SWITCHES 1 THRU 13.                 3A010290
                *     *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY.          3A010300
                *            SWS 1 THRU 13 ALL OFF, NO DELAY.          3A010310
                *  2. IF BYPASS COMPARE ERROR WAIT 6 OPTION IS         3A010320
                *     DESIRED, TURN ON BIT SWITCH 15.                  3A010330
                *                                                      3A010340
B. LOADING      *  LOAD IPL FROM CARD OR PAPER TAPE.                   3A010350
                *                                                      3A010360
C. WAITS     1  *  SET BIT SWITCHES 0 THRU 11 TO EXPECTED COLUMN       3A010370
                *  DATA AND SET BITS 12 THRU 15 OFF.                   3A010380
                *  LOAD PREPUNCHED CARDS INTO READER AND MAKE RDY.     3A010390
                *  DEPRESS START.                                      3A010400
                *                                                      3A010410
             4  *  NO INTERRUPT GENERATED AFTER XIO READ.              3A010420
                *  COMMAND WAS GIVEN. SEE COMMENTS.                    3A010430
                *                                                      3A010440
             6  *  COMPARE ERROR. ACCUMULATOR CONTAINS BITS READ.      3A010450
                *  IF ACCUMULATOR CONTAINS /00FF, COLUMN READ WAS      3A010460
                *  NOT STORED INTO READ/IN AREA.                       3A010470
                *  DEPRESS START TO READ NEXT CARD.                    3A010480
                *  TO BYPASS COMPARE ERROR WAIT, SEE PRELOAD.          3A010490
                *                                                      3A010500
D. RESTART      *  1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD      3A010510
                *     SWITCH SETTINGS, DEPRESS IMMEDIATE               3A010520
                *     STOP AND RESET PUSH BUTTONS.                     3A010530
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.         3A010540
                *  3. DEPRESS START.                                   3A010550
                *                                                      3A010560
E. COMMENTS     *  1. LAST DSW SENSED IS DISPLAYED IN THE Q REG.       3A010570
                *  2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON        3A010580
                *     OR TO BYPASS THE INTERRUPT WAIT, LOAD /6010      3A010590
                *     INTO LOCATION /0037 AND DO A PROGRAM RESTART.    3A010600
                *  3. TO SET UP LOOP TO EXECUTE XIO, LOAD /6010        3A010610
                *     INTO LOCATION /0037 AND LOAD /1000 INTO          3A010620
                *     LOCATION /003A AND DO A PROGRAM RESTART.         3A010630
                *                                                      3A010640
                *****************************************************  3A010650
0000                    ORG     0                                      3A010660
0000 0 601F     RDBGN   LDX     RDRLD   *A* TO /6020 LOX RDRST         3A010670
0001 0 00FF     RDARA   OC      /00FF     READ IN AREA                 3A010680
0002 0 0006     RDBSW   DC      RDDSW     BIT SW SAVE AREA             3A010690
0003 0 003A             OC      /003A   *A* TO /3A00 RD BIT WSW         3A010700
0004 0 0001     RDRRD   OC      RDARA     READ IN AREA ADDR            3A010710
0005 0 0012             DC      /0012   *A* TO /1200 XIO READ          3A010720
0006 0 6020     RDDSW   LOX     RDRST     BIT SW SAVE AREA             3A010730
0007 0 8818             DC      /8818   *A* TO /1703 XIO SENSE         3A010740
0008 0 000F     RDRGO   DC      RDI04     INTERRUPT ADDR               3A010750
0009 0 2808             DC      /2808   *A* TO /1404 XIO START         3A010760
000A 0 0000     RDERR   OC      *-*       LAST RDR COMPARE ERR         3A010770
000B 0 0000     RDDSV   DC      *-*       LAST DSW SENSED              3A010780
000C 0 000F             OC      RDI04     INTERRUPT ADDR               3A010790
000D 0 00FF     RDOFF   DC      /00FF     CONSTANT /00FF               3A010800
000E 0 0001     RDONE   DC      1         CONSTANT 1                   3A010810
000F 0 0000     RDI04   DC      *-*       INTERRUPT ENTRY              3A010820
0010 0 08F5             XIO     RDDSW     SENSE AND SAVE DSW           3A010830
0011 0 00F9             STO     RDDSV     *                            3A010840
0012 0 4850             BOSC    -         CK FOR RD RESPONSE           3A010850
0013 0 7024             MDX     RDCOP     NO, CK OP COMPLETE           3A010860
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0014 0 08FF             XIO     RDRRD   YES, READ COLUMN             3A010870
0015 0 C0F0             LD      RDDSW   CK IF COMPARE TO SWS         3A010880
0016 0 1804             SRA     4       *                            3A010890
0017 0 1004             SLA     4       *                            3A010900
0018 0 F0E8             EOR     RDARA   *                            3A010910
0019 0 4B18             BSC     &-      *                            3A010920
001A 0 701C             MDX     RDINT   YES, WAIT NXT INTRPT         3A010930
001B 0 C0E5             LD      RDARA   NO,SAVE COL READ             3A010940
001C 0 D0ED             STO     RDERR   *                            3A010950
001D 0 6802             STX     RDESW   SET ERR SW                   3A010960
001F 0 701B             MDX     RDINT   WAIT FOR NXT INTRPT          3A010970
001F 0 C0E3     ROBLD   LD      RDBSW&1 BUILD IOCCS AND              3A010980
0020 0 1008     RDESW   SLA     8       * RESET/START BRANCH         3A010990
0021 0 D0E1             STO     RDBSW&1 *                            3A011000
0022 0 C0E4             LD      RDOSW&1 *                            3A011010
0023 0 1803             SRA     3       *                            3A011020
0024 0 D0E2             STO     RDOSW&1 *                            3A011030
0025 0 C0F3             LD      RDRGO&1 *                            3A011040
0026 0 1801             SRA     1       *                            3A011050
0027 0 00E1             STO     RDRGO&1 *                            3A011060
0028 0 C0DC             LD      RDRRD&1 *                            3A011070
0029 0 1008             SLA     8       *                            3A011080
002A 0 D0DA             STO     RDRRD&1 *                            3A011090
002B 0 C0DA             LD      RDDSW   *                            3A011100
002C 0 00D3             STO     RDBGN   *                            3A011110
002D 0 08D4     RORST   XIO     ROBSW   READ SWS DELAY/OPT           3A011120
002E 0 C0D7             LD      RDDSW   * SAVE DELAY/OPTION          3A011130
002F 0 D0EF             STO     ROBLO   *                            3A011140
0030 0 3001             WAIT    1       SET READ PATTERN             3A011150
0031 0 C0DB             LD      RDOFF   *                            3A011160
0032 0 D0CE             STO     ROARA   *                            3A011170
0033 0 1010             SLA     16      INITIALIZE AND READ          3A011180
0034 0 D0EB             STO     ROESW   * BIT SWS                    3A011190
0035 0 08CC             XIO     ROBSW   *                            3A011200
0036 0 08D1             XIO     RDRGO   START READER                 3A011210
0037 0 3004     RDINT   WAIT    4       WAIT FOR INTERRUPT           3A011220
0038 0 1004     RDCOP   SLA     4       CK FOR OP COMPLETE           3A011230
0039 0 4850             BOSC    -       *                            3A011240
003A 0 70D5             MDX     RDI04&1 NO, RESENSE OSW              3A011250
003B 0 C8CE             LOD     ROOSV-1 YES, LOAD DSW IN Q           3A011260
003C 0 C0E2             LD      RDBLD   SET UP DELAY                 3A011270
0030 0 1801             SRA     1       *                            3A011280
003E 0 90CF     RDLOP   S       RDONE   *                            3A011290
003F 0 4810             BSC     -       *                            3A011300
0040 0 70F0             MDX     RDLOP   *                            3A011310
0041 0 C0DE             LD      RDFSW   CK IF ERR SW ON              3A011320
0042 0 4818             BSC     &-      *                            3A011330
0043 0 70F0             MDX     RDRST&4 NO, RD NXT CARD              3A011340
0044 0 C00A             LD      RDBLD   YES, CK IF LOOP              3A011350
0045 0 100F             SLA     15      * ON ERROR(BIT 15)           3A011360
0046 0 4820             BSC     Z       *                            3A011370
0047 0 70ED             MDX     RDINT-2 YES, RD BIT SWS              3A011380
0048 0 C8CI             LOD     RDDSV-1 NO, DISPLAY RD ERR           3A011390
0049 0 3006             WAIT    6       * AND DSW AT WAIT 6          3A011400
004A 0 70E6             MDX     RDRST&4 RD NEXT CARD                 3A011410
                *****************************************************  3A011420
0048 0 0040             OC      /0040   THE LAST FIVE WOROS ARE      3A011430
004C 0 9000             DC      /9000   * USED FOR PROGRAM           3A011440
0040 0 2000             DC      /2000   * IDENTIFICATION. THREE      3A011450
004E 0 2000             DC      /2000   * FOR THE PID AND TWO FOR     3A011460
004F 0 0004             DC      /0004   * SEQUENCE.                  3A011470
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                        ************************************************** 3A011490
                        *                                                * 3A011500
6.08 2310 DISK SEEK     *  1. THE PROGRAM ALLOWS THE HEAD TO ACCESS BACK * 3A011510
                        *     AND FORTH BETWEEN 2 CYLINDERS WHICH ARE    * 3A011520
                        *     CONTROLLED BY THE OPERATOR.                * 3A011530
                        *  2. AN OPTION IS AVAILABLE TO ALLOW A WAIT AFTER* 3A011540
                        *     EACH SEEK OPERATION.                       * 3A011550
                        *  3. THE PROGRAM CAN BE USED TO POSITION THE HEAD* 3A011560
                        *     BEFORE LOADING THE 2310 WRT/RD/COMPARE     * 3A011570
                        *     PROGRAM. 6.09                              * 3A011580
                        *                                                * 3A011590
A. PRELOAD SWS           *  1. SET DESIRED DISK DRIVE AREA CODE IN BIT     * 3A011600
                        *     SWITCHES 0 THRU 7.                         * 3A011610
                        *              DRIVE 0 --- 20XX                  * 3A011620
                        *              DRIVE 1 --- 88XX                  * 3A011630
                        *              DRIVE 2 --- 90XX                  * 3A011640
                        *              DRIVE 3 --- 98XX                  * 3A011650
                        *              DRIVE 4 --- A0XX                  * 3A011660
                        *  2. IF WAIT AFTER EACH SEEK OPERATION IS DESIRED,* 3A011670
                        *     SET BIT SWITCH 15 ON.                      * 3A011680
                        *                                                * 3A011690
B. LOADING              *  LOAD IPL FROM CARD OR PAPER TAPE.             * 3A011700
                        *                                                * 3A011710
C. WAITS          1     *  SET DESIRED HEX CYLINDER ADDRESS IN BIT       * 3A011720
                        *  SWITCHES 0 THRU 7. SEE PAGE 2A.               * 3A011730
                        *  SET DESIRED HEX NUMBER OF CYLINDERS TO SEEK IN* 3A011740
                        *  BIT SWITCHES 8 THRU 15.                       * 3A011750
                        *  DEPRESS START.                                * 3A011760
                        *                                                * 3A011770
                    5   *  NO INTERRUPT GENERATED AFTER INITIAL XIO SEEK  * 3A011780
                        *  HOME WAS EXECUTED. SEE COMMENTS               * 3A011790
                        *                                                * 3A011800
                    6   *  NO INTERRUPT GENERATED AFTER XIO SEEK WAS      * 3A011810
                        *  EXECUTED. SEE COMMENTS                        * 3A011820
                        *                                                * 3A011830
D. RESTART              *  1. TO RESTART PROGRAM OR RESET SWITCH SETTINGS,* 3A011840
                        *     DEPRESS IMMEDIATE STOP AND RESET PUSH BUTTONS.3A011850
                        *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.   * 3A011860
                        *  3. DEPRESS START.                             * 3A011870
                        *                                                * 3A011880
E. COMMENTS             *  1. LAST OSW SENSED IS DISPLAYED IN THE Q REG. * 3A011890
                        *  2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON  * 3A011900
                        *     AND TO BYPASS THE INTERRUPT WAIT, LOAD /6012* 3A011910
                        *     INTO LOCATIONS /0039 AND /0041.            * 3A011920
                        *     DO A PROGRAM RESTART.                      * 3A011930
                        *                                                * 3A011940
                        ************************************************** 3A011950
0000                            ORG     0                                 3A011960
0000 0 601B             DKBGN   LOX     DK8LD   *A* TO /6020 LOX DKRST    3A011970
0001 0 0000             DKENT   DC      *-*       INTERRUPT ENTRY SW      3A011980
0002 0 000E             OKBSW   DC      OKBIT     8IT SW SAVE             3A011990
0003 0 003A                     DC      /003A   *A* TO /3A00 RD 8IT SWS   3A012000
0004 0 00CA             DKHME   DC      202       MAX NUMBER OF SEEKS     3A012010
0005 0 0000                     DC      *-*       IDCC-SEEK HOME          3A012020
0006 0 0000             DKSEK   DC      *-*       NUMBER OF SEEKS         3A012030
0007 0 0000                     DC      *-*       IOCC-SEEK               3A012040
0008 0 0000             DKOSW   DC      *-*       AREA CODE/SW OPTIONS    3A012050
0009 0 0000                     DC      *-*       IOCC-SENSE RESET DSW    3A012060
000A 0 0011                     DC      DKIN2     INTERRUPT ADDRESS       3A012070
0008 0 0000             OKOSV   DC      *-*       LAST DSW                3A012080
000C 0 0004             OK004   DC      /0004     CONSTANT 4              3A012090
000D 0 00EF             DKOFF   DC      /00FF     CONSTANT FF             3A012100
000E 0 6020             DKBIT   LDX     DKRST     RESET VECTER            3A012110
000F 0 7010             DK8D1   DC      /7010     DSW BUILD WORD          3A012120
0010 0 0808             DK8D2   DC      /0808     SEEK BUILD WORD         3A012130
0011 0 0000             DKIN2   DC      *-*       OP COMPLETE INTRPT      3A012140
0012 0 08F5                     XIO     DKDSW     SENSE RESET DSW         3A012150
0013 0 D0F7                     STO     DKDSV     SAVE DSW                3A012160
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0014 0 1002                     SLA     2         CK RDY, NOT BUSY        3A012170
0015 0 4868                     BOSC    &Z        *                       3A012180
0016 0 6012                     LOX     DKIN2&1   NO, LOOP                3A012190
0017 0 C0F9                     LD      DKFNT     LD INTERRUPT ENTRY SW   3A012200
0018 0 4820                     BSC     Z         CHECK IE ON             3A012210
0019 0 7020                     MDX     DKMOV   NO, SEEK HOME ENTRY       3A012220
001A 0 7027                     MDX     DKCON     YES, SEEK ENTRY         3A012230
001B 0 C0F2             DK8LD   LD      DK8IT     BUILD RD BIT SW IOCC    3A012240
001C 0 D0E3                     STO     DKBGN     * AND SET PROG RESET    3A012250
001D 0 C0E5                     LD      DKBSW&1   * AND START VECTER       3A012260
001E 0 1008                     SLA     8         *                       3A012270
001F 0 00E3                     STO     DK8SW&1   *                       3A012280
0020 0 08F1             DKRST   XIO     DKBSW     RD AREA CODE AND        3A012290
0021 0 C0EC                     LD      DK8IT     * PROG OPTIONS          3A012300
0022 0 D0E5                     STO     DKOSW     SAVE SWS                3A012310
0023 0 180B                     SRA     11        SET UP AREA CODE        3A012320
0024 0 100B                     SLA     11        *                       3A012330
0025 0 00E8                     STO     DK8IT     SAVE AREA CODE          3A012340
0026 0 C0E8                     LD      DK8D1     BUILD OSW AND SEEK      3A012350
0027 0 1804                     SRA     4         * IOCCS                 3A012360
0028 0 E8E5                     OR      DK8IT     *                       3A012370
0029 0 00DF                     STO     DKDSW&1   *                       3A012380
002A 0 C0E5                     LD      DK8D2     *                       3A012390
002B 0 1801                     SRA     1         *                       3A012400
002C 0 E8E1                     OR      DKBIT     *                       3A012410
002D 0 0007                     STO     DKHME&1   *                       3A012420
002E 0 D0D8                     STO     DKSEK&1   *                       3A012430
002F 0 3001                     WAIT    1         SET STARTING CYL.       3A012440
0030 0 08D1                     XIO     DKBSW     * AND NUM OF CYLS.      3A012450
0031 0 C0DC                     LD      DKBIT     * TO SEEK IN 8IT SWS    3A012460
0032 0 1808                     SRA     8         SET UP START CYL.       3A012470
0033 0 D002                     STO     DKSEK     *                       3A012480
0034 0 08D3                     XIO     DKOSW     SENSE DSW               3A012490
0035 0 D0D5                     STO     DKDSV     SAVE OSW                3A012500
0036 0 C8D3                     LDD     DKDSV-1   LOAD DSW IN Q REG       3A012510
0037 0 68C9                     STX     DKENT     TURN ON INTRPT ENTRY SW 3A012520
0038 0 08CB                     XIO     DKHME     SEEK HOME               3A012530
0039 0 3005                     WAIT    5         WAIT FOR INTERRUPT      3A012540
003A 0 C0CC             DKMOV   LD      DKSEK&1   SET UP SEEK             3A012550
003B 0 E000                     EOR     DK004     * DIRECTION             3A012560
003C 0 00CA                     STO     DKSEK&1   *                       3A012570
003D 0 C8CC                     LDD     DKDSV-1   LOAD OSW IN Q REG       3A012580
003E 0 1010                     SLA     16        TURN OFF INTERRUPT      3A012590
003F 0 00C1                     STO     DKENT     * ENTRY SW              3A012600
0040 0 08C5                     XIO     DKSEK     SEEK                    3A012610
0041 0 3006                     WAIT    6         WAIT FOR INTERRUPT      3A012620
0042 0 C0CB             DKCON   LD      DK8IT     SET UP NUM OF SEEKS     3A012630
0043 0 E0C9                     AND     DKOFF     *                       3A012640
0044 0 00C1                     STO     DKSEK     *                       3A012650
0045 0 C0C2                     LD      DKDSW     CK FOR SEEK AND WAIT    3A012660
0046 0 4804                     BSC     E         *                       3A012670
0047 0 3002                     WAIT    2         YES, WAIT               3A012680
0048 0 70F1                     MDX     DKMOV     NO, GO SEEK             3A012690
                        ************************************************** 3A012700
0049 0 0000                     DC      0         SPACE FILLER            3A012710
004A 0 0000                     DC      0         *                       3A012720
004B 0 0040                     DC      /0040     THE LAST FIVE WORDS ARE 3A012730
004C 0 9000                     DC      /9000     * USED FOR PROGRAM      3A012740
0040 0 2000                     DC      /2000     * IDENTIFICATION. THREE 3A012750
004E 0 2000                     DC      /2000     * FOR THE PID AND TWO FDR 3A012760
004F 0 0002                     DC      /0002     * SEQUENCE.             3A012770
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                *************************************************** 3A012790
                *                                                   3A012800
6.09 2310 WRITE-*  THIS PROGRAM WRITES ON SECTOR 0, A DATA PATTERN  3A012810
     READ-COMPARE *  WHICH WAS SET IN THE BIT SWS. THE DATA IS THEN 3A012820
                *  READ AND COMPARED TO THE BIT SWITCHES. THE HEAD 3A012830
                *  MAY BE POSITIONED WITH SCOPE LOOP 6.08. THIS    3A012840
                *  WILL DESTROY THE SECTOR ADDRESS. IT MAY BE RE-  3A012850
                *  STORED BY PLACING THE SECTOR NUMBER IN THE BIT  3A012860
                *  SWITCHES AND EXECUTING THE PROGRAM ONCE.        3A012870
                *  THE PROGRAM WILL HALT AT WAIT 2 AFTER EACH PASS. 3A012880
                *                                                  3A012890
A. PRELOAD SWS  *  SET THE AREA CODE IN 0-7 FOR THE DISC TO BE USED 3A012900
                *            DRIVE 0 --- 20XX                      3A012910
                *            DRIVE 1 --- 88XX                      3A012920
                *            DRIVE 2 --- 90XX                      3A012930
                *            DRIVE 3 --- 98XX                      3A012940
                *            DRIVE 4 --- A0XX                      3A012950
                *                                                  3A012960
B. LOADING      *  LOAD IPL FROM CARD OR PAPER TAPE.               3A012970
                *                                                  3A012980
C. WAITS     1  *  SET DATA IS BE WRITTEN IN SWITCHES 0-15.        3A012990
                *                                                  3A013000
             2  *  HALT AFTER ONE PASS. TO LOOP PROGRAM, LOAD /1000 3A013010
                *  INTO LOCATION /001F.                            3A013020
                *                                                  3A013030
             3  *  LOST WRITE INTERRUPT. SEE COMMENTS.             3A013040
                *                                                  3A013050
             4  *  LOST READ INTERRUPT. SEE COMMENTS.              3A013060
                *                                                  3A013070
             6  *  COMPARE ERROR BETWEEN THE DATA READ AND THE BIT 3A013080
                *  SWITCHES. THE BITS IN ERROR WILL BE ON IN THE   3A013090
                *  ACCUMULATOR. TO LOOP ON ERROR, LOAD /1000 INTO  3A013100
                *  LOCATION /0017.                                 3A013110
                *                                                  3A013120
D. RESTART      *  1. TO RESTART PROGRAM OR RESET SWITCH SETTINGS, 3A013130
                *     DEPRESS IMMEDIATE STOP AND RESET PUSH BUTTONS 3A013140
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.     3A013150
                *  3. DEPRESS START.                               3A013160
                *                                                  3A013170
E. COMMENTS     *  1. TO RUN THE PROG WITH INTERRUPT DELAY SWITCH  3A013180
                *     ON OR BYPASS THE INTERRUPT WAIT LOAD /600C    3A013190
                *     INTO LOCATION /0047 AND /004A AND RESTART.   3A013200
                *                                                  3A013210
                *  2. TO GET A FASTER LOOP THAN THE ABOVE PLACE    3A013220
                *     /70FE IN THE NEXT LOCATION AFTER THE XIO. THE 3A013230
                *     XIO WILL BE EXECUTED AFTER EACH BRANCH.      3A013240
                *                                                  3A013250
                *  3. IF INTERRUPT IS LOST, 8 REG WILL CONTAIN     3A013260
                *     DATA WORD AND ARITH REG WILL CONTAIN WAIT     3A013270
                *     NUMBER /0003 OR /0004.                       3A013280
                *                                                  3A013290
                *************************************************** 3A013300
0000                    ORG     0                                   3A013310
0000 0 6020     DCBGN   LDX     DCBLO       GO TO PROG              3A013320
0001 0 0000     OCSWS   DC      *-*         SW READ IN AREA         3A013330
0002 0 003A     DCON5   DC      /003A       CONSTANT                3A013340
0003 0 0000     OCXR3   DC      *-*         INDEX REG 3             3A013350
0004 0 6000     DCON1   DC      /6000       CONSTANT                3A013360
0005 0 7010             DC      /7010       CONSTANT                3A013370
0006 0 2820     DCON2   DC      /2820       CONSTANT                3A013380
0007 0 00C3             DC      /00C3       CONSTANT                3A013390
0008 0 0001     OCBSW   DC      DCSWS       SW READ IN AREA         3A013400
0009 0 0000             DC      /0000   *A* DC    /3A00  READ BIT SWS 3A013410
000A 0 0008             DC      DCINT       INTERRUPT AREA          3A013420
000B 0 0000     OCINT   DC      *-*         INTERRUPT ENTRY         3A013430
000C 0 083F             XIO     DCDSW       SENSE DSW               3A013440
000D 0 1001     DCON3   SLA     1           ALSO A CONSTANT         3A013450
000E 0 1001             SLA     1           *                       3A013460
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000F 0 486B             BOSC    &Z          IS DISK READY           3A013470
0010 0 600C             LDX     DCINT&1     * NO                    3A013480
0011 0 C03A             LD      DCDSW       * YES                   3A013490
0012 0 4818             BSC     &-          WAS LAST DP A READ      3A013500
0013 0 7034             MDX     0C6         * NO                    3A013510
0014 0 0000     DC5     DC      /0000   *A* LD   3 1                3A013520
0015 0 F0EB             EOR     DCSWS       COMPARE SWS             3A013530
0016 0 4820             BSC     Z           ANY ERRORS              3A013540
0017 0 3006             WAIT    6           * YES                   3A013550
0018 0 C0EA             LD      DCXR3       ADJ I/O ADRS            3A013560
0019 0 80EF             A       DCBSW       *                       3A013570
001A 0 00E8             STO     DCXR3       *                       3A013580
001B 0 F02F             EOR     DCEND       *                       3A013590
001C 0 4820             BSC     Z           REACHED LIMIT           3A013600
001D 0 70F6             MDX     DC5         * NO                    3A013610
001E 0 3002             WAIT    2           ONE PASS COMPLETE       3A013620
001F 0 701C             MDX     DC1         START OVER              3A013630
                *       INITIALIZATION                              3A013640
0020 0 C0E1     DC8LD   LD      DCON5       GET CONSTANT            3A013650
0021 0 1008             SLA     8                                   3A013660
0022 0 D0E6             STO     DCBSW&1     READ BIT SW IOCC        3A013670
0023 0 08F4             XIO     OCBSW       READ SWS                3A013680
0024 0 C8DC             LDO     DCSWS       GET AREA CODE           3A013690
0025 0 18CC             RTE     12          A- /000X  Q- /000X      3A013700
0026 0 88DD             AO      DCON1       A- /600X  Q- /701X      3A013710
0027 0 18C4             RTE     4           A- /X600  Q- /X701      3A013720
0028 0 D823             STO     OCDSW       SET DSW IOCC            3A013730
0029 0 18D0             RTE     16          A- /X701  Q- /X600      3A013740
002A 0 C0D9             LD      DCON1       A- /6000  Q- /X600      3A013750
002B 0 1808             SRA     8           A- /0060  Q- /X600      3A013760
002C 0 0821             STO     DCRD        SET READ IOCC           3A013770
002D 0 18CB             RTE     11          A- /C000  Q- /0C0X      3A013780
002E 0 F0D5             EOR     DCON1       A- /A000  Q- /0C0X      3A013790
002F 0 18D5             RTE     21          A- /0060  Q- /X500      3A013800
0030 0 D81F             STO     OCWR        SET WRITE IOCC          3A013810
0031 0 C8D4             LDO     DCON2       A- /2820  Q- /00C3      3A013820
0032 0 1805             SRA     5           A- /0141  Q- /00C3      3A013830
0033 0 002C             STO     /0060       SET WDRD COUNT          3A013840
0034 0 8018             A       DCWR        A- /01A1  Q- /00C3      3A013850
0035 0 00CD             STO     DCXR3       SET INDEX REG 3         3A013860
0036 0 D014             STO     OCENO       SET LIMIT CNTL          3A013870
0037 0 18C8             RTE     8           A- /C301  Q- /A100      3A013880
0038 0 00DB             STO     OC5         SET  LD   3 1           3A013890
0039 0 F0D3             EOR     DCON3       A- /D300  Q- /A100      3A013900
003A 0 D003             STO     OC3         SET  STD  3 0           3A013910
003B 0 3001             WAIT    1           SET DATA PATTERN        3A013920
003C 0 08CB     DC1     XIO     DCBSW       READ BIT SWS            3A013930
003D 0 C0C3             LD      DCSWS       GET BIT SWS             3A013940
003E 0 0000     DC3     DC      /0000   *A* STD  3 0                3A013950
003F 0 C0C3             LD      OCXR3       ADJ I/O ADRS            3A013960
0040 0 90C7             S       DCBSW       *                       3A013970
0041 0 D0C1             STO     DCXR3       *                       3A013980
0042 0 F00D             EOR     OCWR                                3A013990
0043 0 4820             BSC     Z           REACHED LIMIT           3A014000
0044 0 70F8             MDX     DC3-1       * NO                    3A014010
0045 0 0006             STO     OCDSW       * YES, CLEAR SW         3A014020
0046 0 0809             XIO     OCWR        WRITE A RECORD          3A014030
0047 0 3003             WAIT    3           WAIT FOR WRITE INTR     3A014040
0048 0 6803     DC6     STX     DCDSW       SET SWITCH              3A014050
0049 0 0804             XIO     DCRD        READ A RECORD           3A014060
004A 0 3004             WAIT    4           WAIT FOR READ INTR      3A014070
                ********************************************************3A014080
004B 0 0040     DCEND   DC      /0040       THE NEXT FIVE WORDS ARE 3A014090
004C 0 9000     DCOSW   DC      /9000       * USED FOR PROGRAM      3A014100
004D 0 2000             DC      /2000       * IDENTIFICATION. THREE 3A014110
004E 0 2000     DCRD    DC      /2000       * FOR THE PID AND TWO EDR 3A014120
004F 0 0001             DC      /0001       * SEQUENCE.             3A014130
0050 0          DCWR    EQU     DCRD&2                              3A014140
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                *************************************************** 3A014160
                *                                                   3A014170
6.10 1627 PLOTTER *  1. THE PROGRAM EXECUTES ALTERNATE FUNCTIONS     3A014180
                *     WHICH HAVE BEEN SELECTED IN THE BIT SWS       3A014190
                *  2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE   3A014200
                *     DELAY BETWEEN XIO WRITE EXECUTIONS.           3A014210
                *  3. AN OPTION IS AVAILABLE TO HALT THE PROGRAM    3A014220
                *     AFTER THE COMPLETION OF THE EXECUTION OF      3A014230
                *     AN ALTERNATE XIO SEQUENCE.                    3A014240
                *                                                   3A014250
   A. PRELOAD SWS *  1. IF DELAY IS DESIRED, SET DELAY CONTROL      3A014260
                *     VALUE IN BIT SWITCHES 1 THRU 13.              3A014270
                *     *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY.       3A014280
                *            SWS 1 THRU 13 ALL OFF, NO DELAY.       3A014290
                *  2. IF A WAIT AFTER EACH PROGRAM PASS IS          3A014300
                *     DESIRED, TURN ON BIT SWITCH 15.               3A014310
                *                                                   3A014320
   B. LOADING   *  LOAD IPL FROM CARD OR PAPER TAPE.               3A014330
                *                                                   3A014340
   C. WAITS   1 *  SET DESIRED FUNCTION CODES IN BIT SWITCHES       3A014350
                *  0 THRU 15. SEE PAGE 2A FOR BIT SW CODES.         3A014360
                *        1ST FUNCTION CODE IN SWS 0 THRU 5.         3A014370
                *        2ND FUNCTION CODE IN SWS 8 THRU 13.        3A014380
                *  TURN ON PLOTTER AND MAKE READY.                  3A014390
                *  DEPRESS START.                                   3A014400
                *                                                   3A014410
              2 *  NORMAL PROGRAM WAIT IF 1 PASS OPTION HAS BEEN    3A014420
                *  SELECTED. DEPRESS START TO MAKE ANOTHER PASS.     3A014430
                *                                                   3A014440
              3 *  NO INTERRUPT GENERATED AFTER XIO WRITE           3A014450
                *  COMMAND WAS GIVEN. SEE COMMENTS.                 3A014460
                *                                                   3A014470
   D. RESTART   *  1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD   3A014480
                *     SWITCH SETTINGS, DEPRESS IMMEDIATE            3A014490
                *     STOP AND RESET PUSH BUTTONS.                  3A014500
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.      3A014510
                *  3. DEPRESS START.                                3A014520
                *                                                   3A014530
   E. COMMENTS  *  1. LAST DSW SENSED IS DISPLAYED IN THE Q REG.    3A014540
                *  2. IF NO FUNCTION ENTERED IN BIT SWS, PROGRAM    3A014550
                *     STOPS AT WAIT 1.                              3AD14560
                *  3. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON     3A014570
                *     OR TO BYPASS THE INTERRUPT WAIT, LOAD /60DD   3A014580
                *     INTO LOCATION /0034 AND DO A PROGRAM RESTART. 3A014590
                *  4. TO SET UP LOOP TO EXECUTE XIO, LOAD /6000     3A014600
                *     INTO LOCATION /0034 AND LOAD /6035 INTO       3A014610
                *     LOCATION /0010 AND DO A PROGRAM RESTART.      3A014620
                *                                                   3A014630
                *************************************************** 3A014640
0000                    ORG     0                                   3A014650
0000 0 6012     PLBGN   LDX     PLBLO   *A* TO /601E LDX PLROS      3A014660
0001 0 0001     PLONE   DC      1          CONSTANT ONE             3A014670
0002 0 0006     PLBSW   DC      PLDSW      BIT SW SAVE AREA         3A014680
0003 0 003A             DC      /003A   *A* TO /3ADD RD BIT SWS     3A014690
0004 0 0006     PLOT    DC      PLOSW      CHARACTER ADDRESS        3A014700
0005 0 0029             DC      /0029   *A* TO /2900 XIO WRITE      3A014710
0006 0 0000     PLDSW   DC      *-*        BIT SW READIN AREA       3A014720
0007 0 002F             DC      /002F   *A* TO /2F01 XIO SENSE      3A014730
0008 0 601F     PLRST   LDX     PLRDS      RESET START MOD          3A014740
0009 0 0000     PLDSV   DC      *-*        OSW SAVE AREA            3A014750
000A 0 0000     PLSET   DC      *-*        SW OPTION/DELAY SAVE     3A014760
000B 0 000C             DC      PLIN3      INTERRUPT ADDRESS        3A014770
000C 0 0000     PLIN3   DC      *-*        INTERRUPT LEVEL 3        3A014780
000D 0 08F8             XIO     PLDSW      SENSE RESET DSW          3A014790
000E 0 D0FA             STO     PLDSV      SAVE DSW                 3A014800
000F 0 4850             BOSC    -          RESET INT LEVEL          3A014810
0010 0 70FC             MDX     PLIN3&1    RESENSE OSW              3A014820
0011 0 7023             MDX     PLRET      BRANCH TO DELAY          3A014830
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0012 0 C0F2     PLBLO   LD      PLOT&1     BUILD WRITE IOCC         3A014840
0013 0 10D8     PLCTL   SLA     8          * 2ND CHAR SW            3A014850
0014 0 D0F0             STO     PLOT&1     *                        3A014860
0015 0 C0F1             LD      PLDSW&1    BUILD SENSE RESET        3A014870
0016 0 1008             SLA     8          *                        3A014880
0017 0 E8E9             OR      PLONE      *                        3A014890
0018 0 D0EE             STO     PLDSW&1    *                        3A014900
0019 0 C0E9             LD      PLBSW&1    BUILD READ BIT SW        3A014910
001A 0 1008             SLA     8          * IOCC                   3A014920
0018 0 D0E7             STO     PLBSW&1    *                        3A014930
001C 0 C0EB             LD      PLRST      SET UP RESET AND         3A014940
001D 0 D0E2             STO     PLBGN      * START BRANCH           3A014950
001E 0 08E3     PLRDS   XIO     PLBSW      READ BIT SWS FOR         3A014960
001F 0 C0E6             LD      PLDSW      * PROG OPTS/DELAY        3A014970
0020 0 00E9             STO     PLSET      *                        3A014980
0021 0 3001             WAIT    1          SET CHARS IN SWS         3A014990
0022 0 08DF     PLSTR   XIO     PLBSW      READ BIT SWS             3A015000
0023 0 C0E2             LO      PLDSW      CK FOR NO COMMAND        3A015010
0024 0 180A             SRA     10         * ENTERED                3A015020
0025 0 4808             BSC     &          *                        3A015030
0026 0 70FA             MDX     PLSTR-1    * NO, SENSE SWS          3A015040
0027 0 C0DE             LD      PLDSW      *                        3A015050
0028 0 1008             SLA     8          *                        3A015060
0029 0 180A             SRA     10         *                        3A015070
002A 0 4808             BSC     &          *                        3A015080
0028 0 70F5             MDX     PLSTR-1    * NO, SENSE SWS          3A015090
002C 0 C8DB     PLSEN   LDD     PLDSV-1    LOAD LAST OSW IN Q .     3A015100
0020 D 0808             XIO     PLDSW      CHK DEVICE NOT BUSY      3A015110
002E 0 D0DA             STO     PLDSV      SAVE DSW                 3A015120
002F 0 1004             SLA     4          *                        3A015130
0030 0 4828             BSC     &Z         *                        3A015140
0031 0 70FA             MDX     PLSEN      *                        3A015150
D032 0 C8D5             LOO     PLDSV-1    LOAD LAST OSW IN Q .     3A015160
0033 0 08D0             XIO     PLOT       WRITE CHARACTER          3A015170
0034 0 3003             WAIT    3          WAIT FOR INTERUPT        3A015180
0035 0 C8D2     PLRET   LDD     PLDSV-1    LOAD LAST DSW IN Q .     3A015190
0036 0 C0D3             LD      PLSET      SET UP DELAY AND         3A015200
0037 0 1801             SRA     1          * EXECUTE DELAY          3A015210
0038 0 90C8     PLLOP   S       PLONE      *                        3A015220
0039 0 4810             BSC     -          *                        3A015230
003A 0 70F0             MDX     PLLOP      *                        3A015240
003B 0 C0CA             LD      PLDSW      LD, SET UP 2ND CHAR      3A015250
003C 0 4804             BSC     E          CHK IF WAIT REQUSTED     3A015260
003D 0 3002             WAIT    2          YES                      3A015270
003F 0 1802             SRA     2          NO, CHK 2ND CHAR OK      3A015280
D03F D 4818             BSC     &-         *                        3A015290
0040 0 70E0             MDX     PLSTR-1    NO, GO TO WAIT 1         3A015300
0041 0 100A             SLA     10         YES, SET UP 2ND CHAR     3A015310
0042 0 00C3             STO     PLDSW      *                        3A015320
0043 0 C0CF             LO      PLCTL      CHK IF 2ND CHAR SW       3A015330
0044 0 4820             BSC     Z          * OFF                    3A015340
0045 0 7002             MDX     PLALT      NO, BRANCH               3A015350
0046 0 68CC             STX     PLCTL      YES, SET 2ND CHAR SW     3A015360
0047 0 700A             MDX     PLSTR      GO LOOP PROGRAM          3A015370
0048 0 1010     PLALT   SLA     16         CLR 2ND CHAR SW          3A015380
0049 0 00C9             STO     PLCTL      *                        3A015390
004A 0 70E1             MDX     PLSEN      GO CHK IF PRINT BUSY     3A015400
                ************************************************** 3A015410
004B 0 0040             DC      /D040      THE LAST FIVE WORDS ARE  3A015420
004C 0 9000             DC      /9000      * USED FOR PROGRAM       3A015430
004D 0 2000             DC      /2000      * IDENTIFICATION. THREE  3A015440
004E 0 1000             DC      /1000      * FOR THE PID AND TWO FOR 3A015450
004F 0 2000             DC      /2000      * SEQUENCE.              3A015460
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                *************************************************** 3A015480
                *                                                   3A015490
6.11 2501 READER*  1. THE PROGRAM READS 80 COLUMNS OF DATA AND      3A015500
                *     COMPARES EACH WORD WITH THE SIT SWITCHES.     3A015510
                *  2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE   3A015520
                *     DELAY BETWEEN XIO READ EXECUTIONS.            3A015530
                *  3. AN OPTION IS AVAILABLE TO BYPASS WAIT 6       3A015540
                *     ON COMPARE ERRORS.                            3A015550
                *                                                   3A015560
A. PRELOAD SWS   *  1. IF DELAY IS DESIRED, SET DELAY CONTROL      3A015570
                *     VALUE IN BIT SWITCHES 1 THRU 13.              3A015580
                *     *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY.       3A015590
                *            SWS 1 THRU 13 ALL OFF, NO DELAY.       3A015600
                *  2. IF BYPASS COMPARE ERROR WAIT 6 OPTION IS      3A015610
                *     DESIRED, TURN ON BIT SWITCH 15.               3A015620
                *                                                   3A015630
B. LOADING       *  LOAD IPL FROM CARD OR PAPER TAPE.              3A015640
                *                                                   3A015650
C. WAITS      1  *  SET BIT SWS 0 THRU 11 TO EXPECTED COLUMN       3A015660
                *  DATA AND SET BITS 12 THRU 15 OFF.              3A015670
                *  LOAD PREPUNCHED CARDS INTO READER AND MAKE READY.3A015680
                *  DEPRESS START.                                 3A015690
                *                                                 3A015700
              4 *  NO INTERRUPT GENERATED AFTER XIO READ.         3A015710
                *  COMMAND WAS GIVEN. SEE COMMENTS.               3A015720
                *                                                 3A015730
              6 *  COMPARE ERROR. ACCUMULATOR CONTAINS BITS READ. 3A015740
                *  IF ACCUMULATOR CONTAINS /DOC8, COLUMN READ WAS 3A015750
                *  NOT STORED INTO READ/IN AREA.                  3A015760
                *  DEPRESS START TO COMPARE NEXT COLUMN.          3A015770
                *  TO BYPASS COMPARE ERROR WAIT, SEE PRELOAD.     3A015780
                *                                                 3A015790
D. RESTART       *  1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD 3A015800
                *     SWITCH SETTINGS, DEPRESS IMMEDIATE         3A015810
                *     STOP AND RESET PUSH BUTTONS.               3A015820
                *  2. SET DESIRED PRELOAD BIT SWITCH SETTINGS.    3A015830
                *  3. DEPRESS START.                              3A015840
                *                                                 3A015850
E. COMMENTS      *  1. LAST DSW SENSED IS DISPLAYED IN THE Q REG.  3A015860
                *  2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON   3A015870
                *     OR TO BYPASS THE INTERRUPT WAIT, LOAD /600F 3A015880
                *     INTO LOCATION /002F AND DO A PROGRAM RESTART.3A015890
                *  3. TO SET UP LOOP TO EXECUTE XIO, LOAD /600F   3A015900
                *     INTO LOCATION /002F AND LOAD /6027 INTO     3A015910
                *     LOCATION /0013 AND DO A PROGRAM RESTART.    3A015920
                *                                                 3A015930
                *************************************************** 3A015940
0000                    ORG     0                                  3A015950
0000 0 6035 CR8GN LDX   CR8L0   *A* TO /6030 LDX CRRST             3A015960
0001 0 0001 CRONE DC    1           CONSTANT 1                     3A015970
0002 0 0004 CRBSW DC    CROSW       BIT SW SAVE ADDR               3A015980
0003 0 003A       DC    /003A       *A* TO /3A00 RD BIT SWS        3A015990
0004 0 6030 CRDSW LDX   CRRST       BIT SW SAVE AREA               3A016000
0005 0 0027       DC    /0027   *A* TO /4F01 XIO SENSE DSW        3A016010
0006 0 0036 CRRDR DC    CRARA       CARD READ IN ADDR              3A016020
0007 0 0027       DC    /0027   *A* TO /4E00 XIO START RDR        3A016030
0008 0 00FF CRERR DC    /00FF       SAVE READ ERROR                3A016040
0009 0 0000 CRDSV DC    *-*         LAST DSW SENSED                3A016050
000A 0 0000 CREND DC    *-*     *A* TO /D11A END OF RD AREA        3A016060
000B 0 C022 CRSRA DC    /C022       LD READ AREA                   3A016070
000C 0 000E       DC    CRIN4       INTERRUPT ADDR                 3A016080
000D 0 0005 CR080 DC    /0005   *A* TO /0050 CONSTANT 80           3A016090
000E 0 0000 CRIN4 DC    *-*         INTERRUPT ENTRY                3A016100
000F 0 08F4       XIO   CRDSW       SENSE DSW                      3A016110
0010 0 00F8       STO   CRDSV       SAVE DSW                       3A016120
0011 0 1004       SLA   4           CK FOR OP COMPLETE             3A016130
0012 0 4850       BDSC  -           *                              3A016140
0013 0 70F8       MDX   CRIN4&I     NO, RESENSE DSW                3A016150
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0014 0 C022 CRLD  LD    CRARA&1   LOAD COLUMN READ               3A016160
0015 0 D0F2       STO   CRERR     SAVE BITS READ                 3A016170
0016 0 F0E0       EOR   CRDSW     COMPARE WITH PATT WD           3A016180
0017 0 4818       BSC   &-        CK FOR COMPARE ERR             3A016190
0018 0 7006       MDX   CRMOD     NO, SET UP NEXT CHK            3A016200
0019 0 C01B       LO    CRBLD     YES, CK LOOP OPT               3A016210
001A 0 100F       SLA   15        *                              3A016220
001B 0 4828       BSC   &Z        *                              3A016230
001C 0 700A       MDX   CRLOP-3   LOOP ERR OPTION ON             3A016240
001D 0 C8EA       LOD   CRERR     LD DSW AND ERR BITS            3A016250
001E 0 3006       WAIT  6         COMPARE ERROR WAIT             3A016260
001F 0 C0F4 CRMOD LD    CRLD      SET UP NEXT COMPARE            3A016270
0020 0 80E0       A     CRONE     *                              3A016280
0021 0 D0F2       STO   CRLD      *                              3A016290
0022 0 90E7       S     CREND     CK IF ALL COLUMNS              3A016300
0023 0 4828       BSC   &Z        * CHECKED                      3A016310
0024 0 70EF       MDX   CRLD      NO, COMPARE NXT COL            3A016320
0025 0 C0E5       LD    CRSRA     SET UP FOR NXT CARD            3A016330
0026 0 00E0       STO   CRLD      *                              3A016340
0027 0 C8E0       LDO   CRERR     LOAD LAST DSW IN Q             3A016350
0028 0 C00C       LD    CRBLD     SET UP DELAY                   3A016360
0029 0 1801       SRA   1         *                              3A016370
002A 0 9006 CRLOP S     CRONE     *                              3A016380
002B 0 4810       BSC   -         *                              3A016390
002C 0 70FD       MDX   CRLOP     *                              3A016400
002D 0 08D4 CRSTR XIO   CR8SW     RD BIT SWS PATT WD             3A016410
002E 0 08D7       XIO   CRRDR     READ A CARD                    3A016420
002F 0 3004       WAIT  4         WAIT FOR INTERRUPT             3A016430
0030 0 0801 CRRST XIO   CR8SW     RD SWS FOR DELAY/OPT           3A016440
0031 0 C0D2       LD    CRDSW     SAVE DELAY/DPTIONS             3A016450
0032 0 D002       STO   CRBLD     *                              3A016460
0033 0 3001       WAIT  1         SET PATTERN IN SWS             3A016470
0034 0 70F8       MDX   CRSTR     GO READ BIT SWS                3A016480
0035 0 C0CD CR8LD LD    CR8SW&1   BUILD PROGRAM                  3A016490
0036 0 1008 CRARA SLA   8       *A* TO /0050 WD CNT 80         3A016500
0037 0 D0CB       STO   CR8SW&I *A* TO *-* READ/IN AREA          3A016510
0038 0 C0C8       LD    CRDSW     *                              3A016520
0039 0 D0C6       STO   CRBGN     *                              3A016530
003A 0 C0CA       LD    CRDSW&1   *                              3A016540
003B 0 1001       SLA   1         *                              3A016550
003C 0 E8C4       DR    CRDNE     *                              3A016560
003D 0 1008       SLA   8         *                              3A016570
003E 0 E8C2       OR    CRDNE     *                              3A016580
003F 0 D0C5       STO   CRDSW&1   *                              3A016590
0040 0 C0C6       LO    CRRDR&1   *                              3A016600
0041 0 1009       SLA   9         *                              3A016610
0042 0 D0C4       STO   CRRDR&1   *                              3A016620
0043 0 C0C9       LD    CR080     *                              3A016630
0044 0 1004       SLA   4         *                              3A016640
0045 0 D0F0       STO   CRARA     *                              3A016650
0046 0 80C4       A     CRSRA     *                              3A016660
0047 0 D0C2       STO   CREND     *                              3A016670
0048 0 70E7       MDX   CRRST     EXECUTE PROGRAM                3A016680
                *************************************************** 3A016690
0049 0 0000       DC    0         SPACE FILLER                   3A016700
004A 0 0000       DC    0         *                              3A016710
0048 0 0040       DC    /0040     THE LAST FIVE WORDS ARE        3A016720
004C 0 9000       DC    /9000     * USED FOR PROGRAM             3A016730
004D 0 2000       DC    /2000     * IDENTIFICATION. THREE        3A016740
004E 0 1000       DC    /1000     * FOR THE PID AND TWO FOR      3A016750
004F 0 1000       DC    /1000     * SEQUENCE.                    3A016760
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                *************************************************** 3A0167B0
                *                                                     3A016790
6.12 1403 PRINTER *  THIS PROGRAM WILL PRINT ANY CHARACTER ENTERED    3A016800
                *  IN THE BIT SWITCHES 1-7 AND 9-15. IF BIT 14 IS DN3A016810
                *  THE BIT SWS 1-12 WILL BE THE CHANNEL THAT THE    3A016820
                *  CARRIAGE WILL SKIP TO AFTER PRINTING.            3A016830
                *                                                   3A016840
A. PRELOAD SWS  *  BIT SW 15- HALT AFTER ONE PASS.                  3A016850
                *         14- CARR SKIP FUNCTION.                  3A016860
                *  1 THRU 12- CHANNEL NUMBER TO USE FOR SKIP.       3A016870
                *                                                   3A016880
B. LOADING      *  IPL MODE FROM CARDS OR PAPER TAPE.               3A016890
                *                                                   3A016900
C. WAIT      1  *  SET CHARACTER TO PRINT, 1-7 AND 9-15.            3A016910
                *                                                   3A016920
             2  *  ONE PASS COMPLETED, PRESS START TO CONTINUE.      3A016930
                *                                                   3A016940
             3  *  LOST PRINTER INTERRUPT.                          3A016950
                *                                                   3A016960
             5  *  LOST CARRIAGE INTERRUPT.                         3A016970
                *                                                   3A0169B0
             6  *  PARITY ERROR FOUND IN THE DSW.                   3A016990
                *                                                   3A017000
D. RESTART      *  PRESS IMMEDIATE STOP AND RESET. PRELOADING       3A017010
                *  SWITCHES MAY BE SET AS DESIRED. PRESS START.     3A017020
                *                                                   3A017030
E. COMMENTS     *  1. TO RUN THE PROG WITH INTERRUPT DELAY SWITCH   3A017040
                *     ON OR BYPASS THE INTERRUPT WAIT LOAD /601F    3A017050
                *     INTO LOCATION /001D AND /0030 AND RESTART.    3A017060
                *                                                   3A017070
                *  2. TO GET A FASTER LOOP THAN THE ABOVE PLACE     3A0170B0
                *     /70FE IN THE NEXT LOCATION AFTER THE XIO. THE 3A017090
                *     XIO WILL BE EXECUTED AFTER EACH BRANCH.       3A017100
                *                                                   3A017110
                *************************************************** 3A017120
0000                    DRG   0                                     3A017130
0000 0 6033             LDX   FPBLD   *A* LOX   FPSTR               3A017140
0001 0 0000 FPSWS DC    *-*           BIT SWITCH STG                3A017150
0002 0 D000 FPDSW DC    /D000 *A* WORD COUNTER                      3A017160
0003 0 F010             DC    /F010 *A* DC    /AF01                 3A017170
0004 0 9000 FPCAR DC    /9000         CHANNEL BITS                  3A017180
0005 0 C000             DC    /C000 *A* DC    /AC00 CARR CNTL       3A017190
0006 0 0001 FPBSW DC    FPSWS         BIT SW STG ADRS & DNE         3A017200
0007 0 003A             DC    /003A *A* DC    /3A00  READ BIT SWS   3A017210
0008 0 0004 FPSKP DC    FPCAR         CARR CHAN ADRS                3A017220
0009 0 9000             DC    /9000 *A* OC    /A900  SKIP IOCC      3A017230
000A 0 0033 FPPRT DC    FPOUT&1       PRINT AREA ADRS               3A017240
000B 0 000A             DC    /000A *A* DC    /AD00 PRINT IOCC      3A017250
000C 0 001E             DC    FPINT         INTERRUPT ADRS          3A017260
                *                                                   3A017270
                *             START AND RESTART OF PROGRAM          3A017280
                *                                                   3A017290
000D 0 08F8 FPSTR XIO   FPBSW         READ BIT SWITCHES             3A017300
000E 0 C0F2             LD    FPSWS   GET SW SETTINGS               3A017310
000F 0 D0FE             STO   FPSWS-3 * AND SAVE                    3A017320
0010 0 1B03             SRA   3                                     3A017330
0011 0 D0F2             STO   FPCAR   SET CHAN NUMBER               3A017340
0012 0 3001             WAIT  1       SET CONSOLE SWS               3A017350
0013 0 08F2 FP1   XIO   FPBSW         READ PRINTER CODE             3A017360
0014 0 C01D             LO    FPDUT   GET WORD COUNT                3A017370
0015 0 D0EC             STO   FPOSW   LDAD XR 2                     3A017380
0016 0 C0EA             LD    FPSWS   GET PRINT CODE                3A017390
0017 0 0002 FP2   DC    /00D2 *A* STO  2 FPDUT                      3A017400
0018 0 C0E9             LD    FPDSW   GET COUNT AND                 3A017410
0019 0 90EC             S     FPBSW   * SUB DNE                     3A017420
001A 0 4820             BSC   Z       AREA FILLED                   3A017430
001B 0 70F9             MDX   FP2-2   * NO                         3A017440
001C 0 0BED             XIO   FPPRT   PRINT A LINE                 3A017450
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001D 0 3003             WAIT  3       WAIT FOR PRINT INTERRUPT      3A017460
001E 0 0000 FPINT DC    *-*           INTERRUPT ENTRY               3A017470
001F 0 08E2             XIO   FPDSW   SENSE DSW                     3A017480
0020 0 4B44             BDSC  E       IS PRINTER READY              3A017490
0021 0 601F             LDX   FPINT&1 * NO                          3A017500
0022 0 4828             BSC   &Z      PARITY ERROR                  3A017510
0023 0 3006             WAIT  6       * YES                         3A017520
0024 0 1002             SLA   2       * NO                          3A017530
0025 0 4B10             BSC   -       PRINT COMPLETE                3A017540
0026 0 70EC             MDX   FP1     * NO, CARR INTR               3A017550
0027 0 C0D6             LD    FPSWS-3 GET CONTROLS                  3A017560
0028 0 4804             BSC   E       HALT ON                       3A017570
0029 0 3002             WAIT  2       * YES                         3A017580
002A 0 100E             SLA   14      * NO                          3A017590
002B 0 4B10             BSC   -       CARR SKIP FUNC                3A017600
002C 0 7002             MDX   FPB     * NO                          3A017610
002D 0 08DA             XIO   FPSKP   SKIP TO CHAN                  3A017620
002E 0 7001             MDX   FP8&1   GO WAIT INTERRUPT             3A017630
002F 0 0BD4 FP8   XIO   FPCAR        * YES, SPACE                  3A017640
0030 0 3005             WAIT  5       WAIT FOR CARR INTR            3A017650
                *                                                   3A017660
0031 0 0001 FP001 DC    /0001         CONSTANT                      3A017670
0032 0 003C FPDUT DC    60            WORD COUNT                    3A017680
                *                                                   3A017690
                *             THIS WILL BE THE PRINT AREA AFTER     3A017700
                *             INITIALIZATION                        3A017710
                *                                                   3A017720
0033 0 C013 FPBLD LD    FPRES                                       3A017730
0034 0 D0CB             STD   0       * SET RESTART                 3A017740
0035 0 C8D5             LDD   FPPRT+1 *  A- /000A  Q- /000A         3A017750
0036 0 BBCD             AD    FPCAR   *  A- /C00A  Q- /900A         3A017760
0037 0 18C4             RTE   4       *  A- /AC00  Q- /A900         3A017770
003B 0 DBCB             STD   FPCAR   * CONTROL IOCC                3A017780
0039 0 D0CF             STD   FPSKP&1 * SKIP IOCC                   3A017790
003A 0 CBD0             LDD   FPPRT+1 *  A- /000A  Q- /000A         3A017800
003B 0 BBC6             AD    FPDSW   *  A- /D00A  Q- /F01A         3A017810
003C 0 18C4             RTE   4       *  A- /AD00  Q- /AF01         3A017820
003D 0 D8C4             STD   FPDSW   * SENSE DSW IOCC              3A017830
003E 0 D0CC             STD   FPPRT&1 * PRINT IOCC                  3A017840
003F 0 C0C7             LD    FPBSW&1 *                             3A017850
0040 0 100B             SLA   B       *                             3A017860
0041 0 D0C5             STD   FPBSW&1 * READ BIT SW IOCC            3A017870
0042 0 C0D4             LD    FP2     *                             3A017880
0043 0 1008             SLA   B       *                             3A017890
0044 0 E8C5             DR    FPPRT   *                             3A017900
0045 0 90EB             S     FP001   ADJUST DISPLACEMENT           3A017910
0046 0 D0D0             STD   FP2     * BUILD  STD   2 FPPRT        3A017920
0047 0 600D FPRES LDX   FPSTR         GO TO PROGRAM                 3A017930
*************************************************** 3A017940
004B 0 0000             DC    0       SPACE FILLER                  3A017950
0049 0 0000             DC    0       *                             3A017960
004A 0 0000             DC    0       *                             3A017970
004B 0 0040             DC    /0040   THE LAST FIVE WORDS ARE       3A0179B0
004C 0 9000             DC    /9000   * USED FOR PROGRAM            3A017990
004D 0 2000             DC    /2000   * IDENTIFICATION. THREE       3A018000
004E 0 1000             DC    /1000   * FOR THE PID AND TWO FOR      3A018010
004F 0 0B00             DC    /0B00   * SEQUENCE.                   3A018020
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                         ************************************************** 3A018040
                         *                                                * 3A018050
6.13 1132 PRINTER        * THE CHARACTER ENTERED IN SWS 0-7 IS PRINTED IN  3A018060
                         *  ALL PRINT POSITIONS.                          * 3A018070
                         *                                                * 3A018080
   A. PRELOAD SWS        *  8IT SW 15--HALT AFTER EACH LINE PRINTED.  SW 15 3A018090
                         *             ALSO CAUSES ONE EXTRA IDLE SCAN CYCLE.3A018100
                         *             THIS HAS A NEGLIGIBLE AFFECT ON SPEED.3A018110
                         *        8-15--PRINT SPEED CONTROL--ENTER THE      3A018120
                         *             DESIRED NUMBER OF IDLE SCAN CYCLES   3A018130
                         *             TO BE TAKEN BETWEEN PRINT CYCLES.    3A018140
                         *        0-7=VALID CHARACTER--PRINT CHARACTER AS   3A018150
                         *                            SHOWN ON PAGE 2.     3A018160
                         *        0-7=INVALID CHARACTER--IDLE CONTINOUSLY.  3A018170
                         *                                                  3A018180
                         *  NOTE--PROGRAM ALWAYS TURNS ON BIT 10 TO PREVENT 3A018190
                         *        OPERATING AT EXCESSIVE SPEEDS.  SPEED MAY 3A018200
                         *        BE INCREASED BY MANUALLY CHANGING CONSTANT 3A018210
                         *        AT CORE LOCATION 0008. USE CAUTION.       3A018220
                         *                                                  3A018230
                         *  SWITCH SETTINGS MAY BE CHANGED AT ANY TIME.     3A018240
                         *                                                  3A018250
   8. LOADING            *  IPL MODE FROM CARDS OR PAPER TAPE               3A018260
                         *                                                  3A018270
   C. WAIT  2            *  ONE PASS COMPLETED, PRESS START TO CONTINUE.    3A018280
                         *                                                  3A018290
            3            *  NO EMITTER RESPONSE INTRPT, RESTART TO CONTINUE 3A018300
                         *                                                  3A018310
            5            *  NO SPACE RESPONSE INTERRUPT, RESTART TO CONTINUE 3A018320
                         *                                                  3A018330
   D. RESTART            *  PRESS IMMEDIATE STOP AND RESET. PRELOADING      3A018340
                         *  SWITCHES MAY BE SET AS DESIRED. PRESS START.    3A018350
                         *                                                  3A018360
   E. COMMENTS           *  TO RUN WITHOUT INTERRUPTS..MANUALLY ENTER       3A018370
                         *  HEX 6008 AT CORE LOCATIONS 0001 AND 003A.       3A018380
                         *                                                  3A018390
                         *  TO CHANGE POSITIONS PRINTED..MANUALLY ENTER     3A018400
                         *  DESIRED PATTERN IN CORE LOCATIONS 001E AND 001F. 3A018410
                         *  AT LEAST ONE BIT MUST BE ON IN SECOND WORD 001F. 3A018420
                         *                                                  3A018430
                         ************************************************** 3A018440
0000                             ORG     0                                 3A018450
0000 0 6017              PRGO    LDX     PRDSW-1 *A* XIO     PRSPS  SPACE PTR 3A018460
0001 0 3005                      WAIT    5           WAIT FOR INTERRUPT    3A018470
                         *                                                  3A018480
0002 0 001A              PRRDS   DC      PRSWS                             3A018490
0003 0 00FF                      DC      /00FF   *A* DC      /3A32  RD SWS 3A018500
0004 0 0018              PRRO    DC      PREMT                             3A018510
0005 0 E8C8                      DC      /F8C8   *A* DC      /3200  RO EMITTER 3A018520
0006 0 7013                      DC      /7013                             3A018530
0007 0 4803                      DC      /4803                             3A018540
0008 0 0020              PRIDL   DC      /0020       MINIMUM IDLE SCAN CYCLES 3A018550
0009 0 000A                      DC      PRINT       INTERRUPT ADDRESS     3A018560
000A 0 0827              PRINT   DC      /0827       INTERRUPT ENTRY       3A018570
000B 0 080C                      XIO     PRDSW                             3A018580
000C 0 4850                      BDSC    -           EMITTER RESPONSE      3A018590
000D 0 7023                      MDX     PRSPR       * NO, TRY SPACE RESPONSE 3A018600
000E 0 C018                      LD      PRSCN+7                           3A018610
000F 0 4820                      BSC     Z           SCAN FIELD ZERO       3A018620
0010 0 7018                      MDX     PREND       * NO, GO STOP PRINTER 3A018630
0011 0 C039                      LD      PRDLY                             3A018640
0012 0 4808                      BSC     +           LAST IDLE SCAN CYCLE  3A018650
0013 0 7027                      MDX     PRPRT       * YES, GO PRINT       3A018660
0014 0 9034                      S       PR          DECRE IDLE COUNT BY ONE 3A018670
0015 0 D035                      STO     PRDLY                             3A018680
0016 0 7023                      MDX     PRWT3                             3A018690
0017 0 C0F2                      LD      PRINT                             3A018700
0018 0 D0E7              PRDSW   STO     PRGO                              3A018710
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0019 0 C8EC                      LDO     PRRD+2  *A* DC      /3701 SENSE DSW 3A018720
001A 0 18C4              PRSTR   RTE     4                                 3A018730
0018 0 00FD                      STO     PRDSW+1 *A* DC      /3480 START PTR 3A018740
001C 0 18D0              PRSTP   RTE     16                                3A018750
001D 0 D0F0                      STO     PRSTR+1 *A* DC      /3440 STOP PTR 3A018760
001E 0 F028              PRFLD   EOR     PRDLY-1 *A* DC      /FFFF         3A018770
001F 0 D0F0                      STO     PRSTP+1 *A* DC      /FFFF         3A018780
0020 0 C8F2              PRSCN   LDD     PRRDS+1                           3A018790
0021 0 18C8                      RTE     8                                 3A018800
0022 0 88E0                      AD      PRRDS+1                           3A018810
0023 0 D8FA                      STD     PRFLD                             3A018820
0024 0 C0F0                      LD      PRRD+1                            3A018830
0025 0 1802                      SRA     2                                 3A018840
0026 0 D0DC                      STO     PRRDS+1                           3A018850
0027 0 1008                      SLA     8                                 3A018860
0028 0 D0DC              PRSPS   STO     PRRD+1                            3A018870
0029 0 C01C                      LD      PR-3    *A* DC      /3401 SPACE PTR 3A018880
002A 0 1802                      SRA     2                                 3A018890
002B 0 D0FD                      STO     PRSPS+1                           3A018900
002C 0 08EF              PREND   XIO     PRSTP       STOP PRINTER          3A018910
002D 0 C0FC                      LD      PRSWS                             3A018920
002E 0 4804                      BSC     E           BIT SW 15 ON          3A018930
002F 0 3002                      WAIT    2           * YES, WAIT           3A018940
0030 0 70CF                      MDX     PRGO                              3A018950
0D1A 0                   PRSWS   EQU     PRSTR                             3A018960
0018 0                   PREMT   EQU     PRDSW                             3A018970
0031 0 1002              PRSPR   SLA     2                                 3A018980
0032 0 4850                      BDSC    -           SPACE RESPONSE        3A018990
0033 0 70D7                      MDX     PRINT+1     * NO, CHECK DSW AGAIN 3A019000
0034 0 10E0                      SLC     32                                3A019010
0035 0 09EA                      STD     PRSCN       CLEAR                 3A019020
0036 0 D8FB                      STD     PRSCN+2       OR SET              3A019030
0037 0 D8EC                      STD     PRSCN+4         SCAN              3A019040
0038 0 D8ED                      STO     PRSCN+6           FIELD           3A019050
0039 0 08E0                      XIO     PRSTR       START PRINTER         3A019060
003A 0 3003              PRWT3   WAIT    3           WAIT FOR INTERRUPT    3A019070
0038 0 08C6              PRPRT   XIO     PRRDS       READ BIT SWITCHES     3A019080
003C 0 08C7                      XIO     PRRD        READ EMITTER          3A019090
003D 0 C0DC                      LO      PRSWS       GET SWS               3A019100
003E 0 E8C9                      OR      PRIDL       OR MINIMUM IDLES      3A019110
003F 0 18C8                      RTE     8                                 3A019120
0040 0 1008                      SLA     8           ISOLATE CHARACTER     3A019130
0041 0 4820                      BSC     Z           SKIP IF NO CHAR ENTERED 3A019140
0042 0 F0D5                      EOR     PREMT       COMPARE WITH EMITTER  3A019150
0043 0 4820                      BSC     Z           SKIP IF SAME CHAR     3A019160
0044 0 70F5                      MDX     PRWT3                             3A019170
0045 0 10C8                      SLC     8                                 3A019180
0046 0 D004                      STO     PRDLY       SET IDLE COUNT        3A019190
0047 0 C8D6                      LDD     PRFLD                             3A019200
0048 0 70EC                      MDX     PRSPR+4                           3A019210
0049 0 0001              PR      DC      /0001                             3A019220
004A 0 00C0                      DC      /00C0                             3A019230
                         ************************************************** 3A019240
004B 0 0040              PRDLY   DC      /0040       THE LAST FIVE WORDS ARE 3A019250
004C 0 9000                      DC      /9000       * USED FOR PROGRAM    3A019260
004D 0 2000                      DC      /2000       * IDENTIFICATION. THREE 3A019270
004E 0 1000                      DC      /1000       * FOR THE PID AND TWO FOR 3A019280
004F 0 0040                      DC      /0040       * SEQUENCE.           3A019290
0050   0000                      END     0                                 3A019300
  NO STATEMENTS FLAGGED IN THIS ASSEMBLY
```

```
CPALT  000D  003E 0042
CP8GN  0000  001C
CP8LO  0012  0000
CP8SW  00D2  0018 001A 001D 0021
CPCTL  0009  000E 0018 003C 003F
CPDSV  000B  0022 0024 0028 002E 002F 0032
CPOSW  0006  0002 0004 0015 0017 001E 0023 002D 0039 0038
CPIN4  002C  000C 0031
CPLOP  0036  0038
CPONE  0001  0036
CPRDS  0010  0009
CPRET  0032  0028
CPSEN  0022  000F 0011 0027 0043
CPSET  0008  001F 0033 0040
CPWRT  0004  0012 0014 0029
CRARA  0036  0006 0014 0045
CRBGN  000D  0039
CR8LD  0035  0000 0019 0028 0032
CR8SW  0002  002D 0030 0035 0037
CRDSV  0009  0010
CRDSW  0004  0002 000F 0016 0031 0038 003A 003F
CREND  000A  0022 0047
CRERR  0008  0015 001D 0027
CRIN4  000E  000C 0013
CRLO   0014  001F 0021 0024 0026
CRLOP  002A  001C 002C
CRMOD  001F  0018
CRONE  0001  0020 002A 003C 003E
CRRDR  0006  002E 0040 0042
CRRST  0030  D004 0048
CRSRA  000B  0025 0046
CRSTR  0020  0034
CRO80  0000  0043
DC8GN  000D
DC8LD  0020  0000
DC8SW  0008  0019 0022 0023 003C 0040
DCDSW  004C  000C 0011 0028 0045 0048
DCEND  0048  001B 0036
DCINT  0008  000A 0010
DCON1  0004  0026 002A 002E
DCON2  0006  0031
DCON3  000D  0039
DCON5  0002  0020
DCRO   004E  002C 0049
DCSWS  0001  0008 0015 0024 0030
DCWR   0050  0030 0034 0042 0046
DCXR3  0003  0018 001A 0035 003F 0041
DC1    003C  001F
DC3    003E  003A 0044
DC5    0014  001D 0038
DC6    0048  0013
DKBD1  000F  0026
DKBO2  0010  002A
DK8GN  0000  001C
DKBIT  000E  0002 001B 0021 0025 0028 002C 0031 0042
DK8LD  0018  0000
DK8SW  0002  001D 001F 0020 0030
DKCON  0042  001A
DKDSV  0008  0013 0035 0036 003D
DKDSW  0008  0012 0022 0029 0034 0045
DKENT  0001  0017 0037 003F
DKHME  0004  002D 0038
DKIN2  0011  000A 0016
DKMOV  003A  0019 0048
DKRST  0020  000E
DKSEK  0006  002E 0033 003A 003C 0040 0044
DKOFF  0000  0043
DK004  000C  003B
```



```
FP8LO  0033  0000
FPBSW  0006  000D 0013 0019 003F 0041
FPCAR  0004  0008 0011 002F 0036 0038
FPDSW  0002  0015 0018 001F 0038 003D
FPINT  001E  000C 0021
FPOUT  0032  000A 0014
FPPRT  000A  001C 0035 003A 003E 0044
FPRES  0047  0033
FPSKP  0008  002D 0039
FPSTR  0000  0047
FPSWS  0001  0006 000E 000F 0016 0027
FP001  0031  0045
FP1    0013  0026
FP2    0017  001B 0042 0046
FP8    002F  002C 002E
KY8GN  0000  0031
KYBLD  0024  0000
KY8SW  0002  0012 0024 0026 0036
KYOCH  000D  0021
KYDSP  0022  0010
KYDSV  0008  0014
KYDSW  0004  0002 0013 001E 0027 0029 0030 0037
KYIN4  0011  000C 003A 003D
KYKEY  000A  0008 000D 000F 0022 0035 003B
KYONE  0001
KYRD   0008  001C 002D 002F
KYROW  001C  0018
KYREQ  0019  0017
KYRST  0032  0004
KYSEL  0006  0010 002A 002C 0033
KYSET  0036  0018 0023
PHBLD  0037  0000
PHBSW  0004  0016 0018 0027 003E 0040
PHCTR  0002  0017 0019 0026
PHDSW  000A  0012 001E 0041 0043
PHFED  0000  0030 003C 003D
PHINT  0011  0008 000C 0024
PHK50  000E  001A
PHPCH  0006  0020 0044 0046
PHPST  0008  0031 0039 0038
PHRES  004A  0037
PHSTK  000C  0033 0047 0049
PHSWS  0003  0006 001D 001F 0028 0034
PH1    000F  004A
PH2    0030  0010 0036
PH4    0020  001C
PH6    0022  0015
PH8    0033  002D
PLALT  0048  0045
PL8GN  0000  001D
PLBLD  0012  0000
PLBSW  0002  0019 001B 001E 0022
PLCTL  0013  0043 0046 0049
PLDSV  0009  000E 002C 002F 0032 0035
PLDSW  0006  0002 0004 000D 0015 0018 001F 0023 0027 0020 0038 0042
PLIN3  000C  000B 0010
PLLOP  0038  003A
PLONE  0001  0017 0038
PLOT   0004  0012 0014 0033
PLRDS  001E  0008
PLRET  0035  0011
PLRST  0008  001C
PLSEN  002C  0031 004A
PLSET  000A  0020 0036
PLSTR  0022  0026 002B 0040 0047
PR     0049  0014 0029
PRDLY  0048  0011 0015 001E 0046
PRDSW  0018  0000 000B 0018
```

```
PREMT   0018  0004 0042
PREND   002C  0010
PRELD   001E  0023 0047
PRGO    0000  0018 0030
PRIDL   000B  003E
PRINT   000A  0009 0017 0033
PRPRT   003B  0013
PRRD    0004  0019 0024 0028 003C
PRRDS   0002  0020 0022 0026 003B
PRSCN   0020  000E 0035 0036 0037 0038
PRSPR   0031  000D 004B
PRSPS   0028  002B
PRSTP   001C  001F 002C
PRSTR   001A  001D 0039
PRSWS   001A  0002 002D 003D
PRWT3   003A  0016 0044
RDARA   0001  0004 0018 001B 0032
RDBGN   0000  002C
RDBLD   001F  0000 002F 003C 0044
RDBSW   0002  001F 0021 002D 0035
RDCOP   0038  0013
RDDSV   000B  0011 003B 004B
RDDSW   0006  0002 0010 0015 0022 0024 002B 002E
RDERR   000A  001C
RDESW   0020  001D 0034 0041
RDINT   0037  001A 001E 0047
RDIO4   000F  0008 000C 003A
RDLOP   003E  0040
RDONE   000E  003E
RDRGO   0008  0025 0027 0036
RDRRD   0004  0014 0028 002A
RDRST   002D  0006 0043 004A
RDOFF   000D  0031
STGBD   003F  0009
STGCR   0004  0015 0022 0023
STGHL   0005  0011 001A 0030 003A
STGLC   0002  0024 0034 0036
STGPG   003E  0037 003E
STGPN   0003  000E 001F 0025 002D
STGRD   0006  000F 0014 0017 0029 002C 0035 0041 0043
STGRS   0048
STGSP   0049  003F
STGST   0009  0000 0040 0048 0049
STGSW   0001  0010 0018
STGXX   0008  0008 000D 0049
STG0    0023  0020 003D
STG1    0025  0039
STG10   003A  0033
STG2    0026  0044 0046
STG3    002A  0047
STG7    0021  001D
TPALT   0028  0045
TPBGN   0000  0018
TPBLD   000D  0000
TPBSW   0002  0014 0016 001C 0026
TPCTL   0009  001A 002C 003F 0046
TPDSV   0008  002E 002F 0034 0036
TPDSW   0006  0002 0004 0010 0013 001D 0021 0028 002A 002D 0035 0042 0044
TPIN4   0033  000C 0039
TPLOP   003C  003E
TPNOT   0046  0041
TPONE   0001  0012 0017 003C
TPPAT   0028  0025
TPROS   001C  0009 004A
TPRET   003A  0032
TPSEN   0020  0027
TPSET   0008  001E 0022 003A 0047
TPWRT   0004  0000 000F 0030
```



```
TP100   000A  0019 0029
TRADV   000A  0029 002C 0041
TRALT   003F  0047 004A
TRARA   0024  0008 000E 0018 001A
TRBGN   0000  002E
TRBLD   0021  0000 0015 001B 0031 0035
TRBSW   0010  0021 0023 002F 0039
TRCTL   0026  003A 003D 0044
TRDSV   0025  0003
TRDSW   000C  0002 001D 0024 0026
TRIN4   0001  0006 002D
TRI4A   0012  0009
TRLDP   001D  0014 0017 001F
TRNDT   0043  003C
TRPAT   0048  0038
TRRD    000E  0007 002B
TRRST   002F  0001
TRSBW   0023  0010 0012 0030 0034 003E 0040 0045 0048
TRSTR   0035  0020
TR100   0022  002B 0049
END OF ASSEMBLY
```

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TABLE OF CONTENTS

1. PURPOSE

THE PURPOSE OF DIMAL IS TO GENERATE A MAINTENANCE LIBRARY OF 1130 DIAGNOSTIC FUNCTION TESTS, AND THEN TO PROVIDE A METHOD FOR BRINGING THESE DIAGNOSTIC TESTS INTO CORE FOR PROGRAM EXECUTION.

2. REQUIREMENTS

2.1 PROGRAM REQUIREMENTS

A. DIMAL CAN BE LOADED ON DISK USING ANY ONE OF THE FOLLOWING IPL DEVICES-
1442 CARD READER, 2501 CARD READER, OR 1134 PAPER TAPE READER.
THESE DEVICES SHALL BE REFERED TO, COLLECTIVELY, AS INPUT DEVICES THROUGHOUT THIS DOCUMENTATION.

B. DIMAL IS CALLED FROM THE DISK PACK BY ONE OF THREE WAYS

1. CALL CARD (SEE SECTION 3.3.1.).
2. CALL TAPE (SEE SECTION 3.3.1).
3. CONSOLE ENTRY SWITCHES (SEE APPENDIX SECTION 6.1).

2.2 EQUIPMENT REQUIREMENTS

A. 1131 CPU.

B. 4K CORE STORAGE.

C. ANY OF THE FOLLOWING INPUT DEVICES-
1442 CARD READER, 2501 CARD READER, OR 1134 PAPER TAPE READER.

D. CONSOLE PRINTER.

E. DISK DRIVE.

F. 2315 C.E. DISK PACK. TRACKS 90-110 ARE NOT USED.

3. USE PROCEDURE

I 3.1 INITIAL DIMAL DISK PACK GENERATION I

THE FOLLOWING PROCEDURE SHOULD BE FOLLOWED TO LOAD DIMAL AND THE DIAGNOSTIC FUNCTION TESTS ON THE C.E. DISK PACK.

1. LOAD AND EXECUTE PROGRAM PID 0308 (2315 DISK INITIALIZATION PROGRAM) TO ENSURE THAT THE DISK SECTORS ARE PROPERLY ADDRESSED, AND THAT ANY BAD CYLINDERS ARE DEFINED.

   REFER TO DIAGNOSTIC MONITOR AND 2315 PROGRAM DOCUMENTATION FOR OPERATING PROCEDURES.

2. LOAD AND EXECUTE PROGRAM PID 0309 (2310 DISK FUNCTION TEST) TO INSURE THAT THE DISK DRIVE IS OPERATING CORRECTLY. REFER TO DIAGNOSTIC MONITOR AND 2310 PROGRAM DOCUMENTATION FOR OPERATING PROCEDURES.

3. AT THE INPUT DEVICE-

   A. CARD READER-1442 OR 2501.
   PLACE PROGRAM DECK 0302 (DIMAL SYSTEM) IN THE HOPPER BEHIND THE 1442 OR 2501 RELOCATING LOADER DEPENDING ON THE INPUT DEVICE. MAKE THE CARD READER READY.

   B. PAPER TAPE-1134-
   READ THE PAPER TAPE RELOCATING LOADER (PID 03AC) INTO CORE.

PLACE THE DIMAL TAPE (PID 0302) IN THE 1134 P.T. READER. SET CONSOLE ENTRY SWITCHES TO /007B, SET MOOE SWITCH TO LOAD, AND PRESS LOAD IAR BUTTON. SET MODE SWITCH TO RUN. PRESS THE 1131 CPU START BUTTON.

4. OBTAIN THE PROGRAM OECKS OR TAPES FOR THE OIAGNOSTIC FUNCTION TESTS TO BE LOADED ON THE DISK.

   A. THE FOLLOWING PROGRAMS CAN BE LOADED ON THE OISK-

      1. 1130 DIAGNOSTIC PROGRAMS.
      2. RPQ PROGRAMS.
      3. 2250 DISPLAY PROGRAMS.
      4. LATEST LEVEL OF THE 1130 DIAGNOSTIC MONITOR II.

      *** VERY IMPORTANT NOTE***

      IN GENERAL, ANY PROGRAM TO BE LOADED ON DISK MUST OBSERVE THE FOLLOWING RULES TO BE DIMAL COMPATIBLE -

      1. PROGRAM ID IS THE FIRST WORD IN THE PROGRAM.
      2. PROGRAMS WITH PIDS LESS THAN 9F - MONITOR CONTROLLED PROGRAMS- SHOULO NOT HAVE MORE THAN 256 CARDS PER DECK.
      3. IF A NON-MONITOR PROGRAM ORGS AT MORE THAN ONE PLACE, THEN EACH ORG ADDRESS MUST BE NUMERICALLY GREATER THAN THE PREVIOUS ORG AODRESS.

   B. THE FOLLOWING PROGRAMS SHOULD NOT BE LOADED ON THE DISK.

      1. PID 03A3 BASIC OIAGNOSTIC LOADER.
      2. PID 03A5 ONE-CARD DIAGNOSTIC PROGRAMS.
      3. PID 03A0 BASIC DIAGNOSTIC LOADER-2501.
      4. PID 03A6 CORE STORAGE ADJUSTMENT TEST.
      5. PIDS 03AA, 03AB, 03AC RELOCATABLE LOADERS FOR THE 1442, 2501, AND PAPER TAPES, RESPECTIVELY.
      6. SCA INTEGRITY TEST.
      7. ONE CARD SCOPE LOOPS PIO 03A0.
      8. PIO 030A DISK ADJUST.

5. PLACE THE DFT PROGRAMS IN THE READER BEHIND DIMAL. PATCHED DECKS CAN BE LOADED PROVIDED THAT PATCH CARDS ARE INSERTED JUST BEFORE THE LAST CARD OF EACH DECK. HEX PATCH CARDS MAY BE ENTERED SEPARATELY TO PATCH EXISTING PROGRAMS ALREADY ON DISK. REFER TO SECTION 3.2.4 FOR DETAILS.

   *** IMPORTANT NOTE ***

   THE FOLLOWING PROGRAMS CAN NOT BE PATCHED -

   1. 1130 DIAGNOSTIC MONITOR II.
   2. PROGRAMS WITH PIDS GREATER THAN 9F.
   3. PROGRAMS PUNCHED IN 8-B FORMAT.

6. THE DFT PROGRAM DECKS MAY BE LOADEO IN ANY ORDER. DO NOT PLACE BLANK CARDS AT THE END OF THE PROGRAMS.

7. AT THE 1131 CPU, PRESS THE RESET AND PROGRAM LOAD BUTTONS. DIMAL SHOULD START REAOING IN.

8. MESSAGE C015 IS PRINTED REQUESTING THE AREA CODE FOR THE DISK DRIVE. ENTER THE AREA CODE IN CONSOLE SWITCHES AND PRESS START.

DISK ORIVE	AREA CODE
CPU	/2000
1	/BB00
2	/9000
3	/9B00
4	/A000

9. MESSAGE C014 IS PRINTED REQUESTING CE CYLINDER NUMBER. ENTER IN CONSOLE SWITCHES /00C7 UNLESS OTHERWISE INDICATED OURING THE RUNNING OF THE DISK INITIALIZATION TEST (PID 0308). PRESS START.

NOTE - IF THE INTERRUPT REQUEST KEY WAS ACCIDENTLY PRESSED, THE INITIAL LOADER MUST BE RESTARTED. THIS CAN BE ACCOMPLISHED BY PRESSING STOP, RESET, AND START BUTTONS ON THE 1131 CPU.

10. MESSAGE C006 IS PRINTED ASKING THE C.E FOR THE NUMBER OF THE INPUT DEVICE. ENTER IN THE CONSOLE SWITCHES ONE OF THE FOLLOWING NUMBERS-DEPENDING ON THE INPUT DEVICE BEING USED- /1442, /2501, /1134. PRESS START.

11. COMMUNICATION OF ERRORS AND OPERATOR ACTIONS IS VIA PRINTOUTS AND PROGRAM WAITS. REFER TO SECTION 4.0 PRINTOUTS, AND SECTION 3.4 PROGRAM WAITS TO OETERMINE WHAT ACTION MUST BE TAKEN FOLLOWING A PRINTOUT OR PROGRAM WAIT.

12. DFT'S WILL START LOADING UNTIL THE INPUT OEVICE GOES NOT READY. MESSAGE C007 IS PRINTED ASKING THE CE TO READY THE INPUT DEVICE.

NOTE - INCASE OF CARD READER ERROR CHECKS -SUCH AS READ REG- NPRO THE CARD(S), PLACE IN FRONT OF REMAINING DECK IN THE HOPPER, AND MAKE IT READY. AT THE 1131 CPU, PRESS START.

13. AT THE CARD READER PRESS THE START BUTTON. THE READER SHOULD GO READY FOR THE LAST CARD. FOR PAPER TAPE, PLACE A STRIP OF BLANK TAPE OVER THE READ STATION.

14. AT THE 1131 CPU PRESS START IF THE INPUT DEVICE IS A 2501 CARD READER . THE LAST CARD SHDULD READ IN. THIS STEP IS NOT REQUIRED FOR A 1442 CARD READER OR 1134 PAPER TAPE READER.

15. DIMAL PRINTS MESSAGE C001.

    IF IT IS DESIRED TO LOAD MDRE DFT'S READY THE INPUT DEVICE WITH DFT PROGRAMS AND PRESS START. DFT LOADING WILL CONTINUE AS BEFORE.

16. IF DFT LOADING IS COMPLETED, SET CONSOLE ENTRY SWITCHES TO /FF00 AND PRESS START.

    ```
    -------------
    I  WARNING  I
    -------------
    ```

    FAILURE TO SET THE SWITCHES PROPERLY TO /FF00 WILL NOT COMPLETE THE GENERATION OF THE DIMAL PACK. RELOADING DIMAL IS NECESSARY.

17. DIMAL WILL COMPLETE THE GENERATION FUNCTION AND PRINT MESSAGE D001 (LOCATION DIRECTORY). PRESS START FDR A LISTING OF THE PROGRAMS AND THEIR LOCATIDNS ON DISK.

    ```
    *****************
    I  NOTE TO CE  I
    *****************
    ```

    THE LOCATION DIRECTORY LISTS THE PROGRAM ID, THE ADDRESS OF THE STARTING CYLINDER, THE TDTAL NUMBER DF SECTORS DCCUPIED BY THE PROGRAM, AND THE STARTING SECTOR.

    HOWEVER, FOR A QUICK REFRENCE TO THE PROGRAMS ON DISK, DIMAL OFFERS AN OPTION THAT LISTS ALL THE PIDS WITHOUT THE OTHER INFORMATION. IF SUCH AN OPTION IS DESIRED AT THIS POINT PRESS STOP, RESET, AND START ON THE 1131 CPU. MESSAGE C004 (SELECT OPTIONS) WILL BE PRINTED. REFER TO SECTION 3.2.11 FOR OPERATING PROCEDURES.

    OPTION 6 AND OPTIDN 5 DR 8 MUST BE PERFORMED AFTER THE PID TABLE HAS BEEN PRINTED.

18. MESSAGE D003 IS THEN PRINTED. THIS MESSAGE INDICATES A SEEK COUNT WHICH IS REQUIRED BY THE BIT SWITCH ENTERED CALL ROUTINE. IT IS SUGGESTED THAT THIS PRINTDUT BE TAPED TO THE C.E. DISK PACK TO AVOID LOSS.

19. MESSAGE C004 IS PRINTED ASKING THE CE TO SELECT OPTIDNS. A CALL CARD DR TAPE MUST BE PUNCHED AT THIS TIME. REFER TO SECTIDN 3.2.7 TO PUNCH A CALL CARD OR 3.2.10 TD PUNCH A CALL TAPE.

    ```
    ********** IMPORTANT NOTE **********
    *                                  *
    * RUNNING OF THE 2315 DISK INITIALIZATION PROGRAM ON THE *
    * MAINTENANCE LIBRARY PACK WILL CAUSE THE LIBRARY TO BE  *
    * DESTROYED.                       *
    ************************************
    ```


I 3.2 EXISTING DIMAL DISK PACK MODIFICATION (LOADER/ORGANIZER SECTION) I

1. GENERAL OPERATING INSTRUCTIONS

   A. PLACE THE C.E. DISK PACK CONTAINING THE MAINTENANCE LIBRARY ON THE DESIRED DISK DRIVE AND MAKE THE DRIVE READY.

   B. OBTAIN THE CALL CARD OR PAPER TAPE PROVIDED BY DIMAL DURING INITIAL DISK LIBRARY GENERATION.

      IF IT IS DESIRED TO CALL DIMAL VIA DATA ENTRY SWITCH CALL ROUTINE, REFER TO APPENDIX SECTION 6.1.

   C. SET CONSOLE ENTRY SWITCHES TO /XX01 (WHERE XX IS THE DISK AREA CODE) TO CALL THE LOADER/DRGANIZER INTO CORE.

DISK DRIVE	AREA CODE
CPU	/2001
1	/BB01
2	/9001
3	/9801
4	/A001

WARNING- FAILURE TD SET 1 IN SWITCH 15 COULD DESTROY THE DIRECTORY TABLE DURING 'ADD A PROGRAM' OPTION. IT IS RECOMMENDED THAT DIMAL BE RECALLED WITH THE PROPER SETTING OF SWITCHES-REFER TO STEP B ABOVE.

   D. IPL THE CALL CARD DR TAPE.

   E. MESSAGE C006 IS PRINTED ASKING THE C.E FOR THE NUMBER DF THE INPUT DEVICE. ENTER IN THE CONSOLE SWITCHES ONE OF THE FOLLOWING NUMBERS-DEPENDING ON THE INPUT DEVICE BEING USED- /1442, /2501, /1134. PRESS START.

   F. THE CALL CARD DR TAPE WILL FIRST LOAD THE DIMAL HEADER TESTS. IF THE HEADER TESTS RUN SUCCESSFULLY (RUN TIME APPROXIMATELY 1 SEC), THE CDLD START LOADER WILL BE BROUGHT INTO CORE AND IN TURN WILL LOAD THE DIMAL LOADER/ORGANIZER SECTION.

      IF AN ERROR WAIT OCCURS, REFER TO SECTION 6.2 FOR ERROR PROCEDURE.

   G. THE LOADER/ORGANIZER THEN PRINTS MESSAGE C004.

      TABLE 1 SUMMERIZES THE OPTIONS AVAILABLE WITH THE LOADER/ ORGANIZER SECTION.

      OPERATING PROCEDURES FOR THE OPTIONS FOLLOW TABLE 1.

TABLE 1

LOADER/ORGANIZER DPTION SWITCHES

```
*****************************************************************************
*   CONSDLE ENTRY SWITCHES *                                                *
* D 1 2 3 4 5 6 7 8 9           DESCRIPTIDN                                 *
* . . . . . . . . . 1...LIST ALL PIDS ON DISK.                              *
* . . . . . . . . 1.....PUNCH CALL PAPER TAPE                               *
* . . . . . . . 1.......DELETE HEX PATCHES FDR A GIVEN PID.                 *
* . . . . . . 1.........LIST THE CALL SEEK COUNT REQUIRED BY THE CONSOLE    *
*                       ENTRY SWITCH CALL RDUTINES.                         *
* . . . . . 1...........PUNCH CALL CARDS.                                   *
* . . . . 1.............LIST CONTENTS OF PATCH TABLE.                       *
* . . . 1...............LIST CONTENTS OF LOCATION DIRECTORY.                *
* . . 1.................ENTER HEX PATCHES SEPARATELY.                      *
* . 1...................DELETE PRDGRAM.                                    *
* 1.....................ADD PROGRAM.                                       *
*                                                                           *
*                                                                           *
* ONLY 1 OPTION AT A TIME MAY BE PERFORMED. OPTION PRIORITY IS FRDM          *
* SWITCH D TD SWITCH 9.                                                     *
*                                                                           *
*****************************************************************************
```

2. ADD PROGRAM TD DIMAL PACK (SWITCH 0)

A. READY THE INPUT DEVICE WITH THE PROGRAM DR PRDGRAMS TO BE ADDED. INSURE THAT THE PATCH CARDS IF ANY ARE INSERTED JUST BEFORE THE LAST CARD OF EACH DECK. DO NOT SEPARATE DECKS WITH BLANK CARDS.

B. AT THE CPU SET CONSOLE ENTRY SWITCH 0, CLEAR ALL OTHERS, AND PRESS START BUTTON. PROGRAMS SHOULD READ UNTIL THE READER BECOMES EMPTY OR THE END OF TAPE IS REACHED.

NOTE-INCASE DF CARD READER ERROR CHECKS -SUCH AS READ REG-NPRO THE CARD(S), PLACE IN FRONT OF REMAINING DECK IN THE HDPPER, AND MAKE IT READY. AT THE 1131 CPU, PRESS START.

C. PRESS THE READER START BUTTDN TO READY IT FOR THE LAST CARD. THIS STEP IS INAPPLICABLE TD PAPER TAPE.

D. PRESS THE 1131 CPU START BUTTON IF THE INPUT DEVICE IS A 2501 CARD READER. LAST CARD SHDULD READ IN. THIS STEP IS NDT REQUIRED IF THE INPUT DEVICE IS A 1442 CARD READER OR AN 1134 PAPER TAPE READER.

E. MESSAGE C001 IS THEN PRINTED, SET CONSOLE ENTRY SWITCHES TO /FF00 AND PRESS START.

F. A NEW LISTING DF THE DISK LOCATIDN DIRECTORY WILL BE PROVIDED BY PRESSING START.

NDTE-IF A DIRECTDRY TABLE IS NOT DESIRED AT THIS TIME, PRESS THE 1131 STDP, RESET, AND START. THIS WILL ALLOW MESSAGE C004 TD BE PRINTED INFDRMING THE CE TD SELECT DPTIONS. IF A LISTING OF ALL THE PIDS ON DISK IS DESIRED REFER TO SECTION 3.2.11 FOR OPERATING PROCEDURES.

G. MESSAGE C004 IS THEN PRINTED INFORMING THE C.E. TO SELECT DPTIDNS.

3. DELETE PRDGRAM FROM DIMAL PACK (SWITCH 1)

A. SET CDNSDLE ENTRY SWITCH 1, CLEAR ALL DTHERS, AND PRESS START.

B. DIMAL PRINTS MESSAGE C002 INFORMING THE C.E. TO ENTER THE PID DF THE PRDGRAM TD BE DELETED VIA CONSOLE ENTRY SWITCHES.

C. ENTER THE PID OF THE PRDGRAM TD DELETE IN CDNSDLE ENTRY SWITCHES B THROUGH 15 AND PRESS START.

D. DIMAL WILL DELETE THE PRDGRAM SPECIFIED AND PRINT A NEW LOCATION DIRECTDRY. IF A PROGRAM HAS BEEN LOADED ON THE DISK MDRE THAN DNCE, THEN THE ABOVE PROCEDURE MUST BE REPEATED TO DELETE THAT PID AGAIN. IF THE PRDGRAM WAS NDT DN DISK, MESSAGE C004 IS PRINTED (SELECT OPTIONS).

NDTE-IF A DIRECTDRY TABLE IS NDT DESIRED AT THIS TIME, PRESS THE 1131 STOP, RESET, AND START. THIS WILL ALLOW MESSAGE C0D4 TO BE PRINTED ASKING THE CE TD SELECT OPTIONS.

E. OPERATION COMPLETE IS INDICATED BY MESSAGE CD04 INFORMING THE C.E. TO SELECT OPTIDNS.

4. ENTER HEX PATCH CARDS SEPARATELY. (CARD PROGRAMS ONLY)(SWITCH 2)

A. SET CDNSOLE ENTRY SWITCH 2, CLEAR ALL OTHERS

B. DBTAIN A COMPLETE SET DF PATCH CARDS FOR THE PROGRAM TO WHICH THE CHANGE IS TO BE MADE. LIMIT YOUR PATCHES TO A MAXIMUM OF 14 HEX WORDS PER CARD. (LEAVE COLUMNS 77-BD OF THE PATCH CARD BLANK)

C. PLACE THE PATCH CARDS IN THE HOPPER AND MAKE IT READY.

D. AT THE 1131 CPU PRESS START.

E. DIMAL MESSAGE C00B IS PRINTED INFDRMING THE C.E. TO ENTER THE PID OF THE PROGRAM TO BE PATCHED VIA CDNSOLE ENTRY SWITCHES . ENTER THE PID IN SWITCHES B THRU 15. PRESS START.

F. PATCH CARDS WILL READ IN UNTIL THE CARD READER BECOMES EMPTY.

G. DEPRESS THE READER START BUTTDN TD READY IT FOR THE LAST CARD.

H. DEPRESS THE 1131 CPU START BUTTON IF THE INPUT DEVICE IS A 2501 CARD READER. THE LAST CARD SHOULD READ IN. THIS STEP IS NOT REQUIRED WHEN USING A 1442 CARD READER.

I. DIMAL MESSAGE D0D2 IS PRINTED. PRESS START FDR A LISTING OF THE PATCH TABLE.

J. OPERATIDN CDMPLETE IS INDICATED BY MESSAGE CD04 INFDRMING THE C.E. TD SELECT OPTIDNS.

*** VERY IMPDRTANT NOTE***

IF A PROGRAM THAT HAS BEEN LOADED ON DISK REQUIRES PATCHING, THEN ANY NEW PATCH CARDS MUST ACCOMPANY OLD PATCHES. THIS IS DUE TO THE FACT THAT AS NEW PATCHES FOR A GIVEN PROGRAM ARE LOADED, ALL THE OLD PATCHES FOR THAT PROGRAM ARE DELETED IN FAVOR OF THE NEW ONES. REFER TO SECTION 3.2.6 FOR A LISTING OF THE PATCH TABLE.

5. LIST CONTENTS OF DIMAL LOCATION DIRECTORY (SWITCH 3)

   A. SET CONSOLE ENTRY SWITCH 3, CLEAR ALL OTHERS, AND PRESS START.

   B. DIMAL WILL LIST THE LOCATION DIRECTORY, MESSAGE 0001.

   C. OPERATION COMPLETE IS INDICATED BY MESSAGE C004 INFORMING THE C.E. TO SELECT OPTIONS.

6. LIST CONTENTS OF DIMAL PATCH TABLE (SWITCH 4)

   A. SET CONSOLE ENTRY SWITCH 4, CLEAR ALL OTHERS, AND PRESS START.

   B. MESSAGE D002 IS PRINTED, PATCH CARD TABLE. PRESS START FOR A LISTING OF THE PATCH TABLE.
   THE TYPEWRITER WILL LINE FEED ONE LINE FOR EVERY EMPTY SECTOR IN THE PATCH CYLINDER.

   C. OPERATION COMPLETE IS INDICATED BY MESSAGE C004 INFORMING THE C.E. TO SELECT OPTIONS.

7. PUNCH CALL CARDS. (SWITCH 5)

   A. SET CONSOLE ENTRY SWITCH 5, CLEAR ALL OTHERS, AND PRESS START.

   B. MESSAGE C005 WILL BE PRINTED. LOAD 1442 WITH BLANK CARDS.

   C. AT THE 1131 CPU, PRESS START. DIMAL SHOULD START PUNCHING THE CALL CARD.

   D. OPERATION COMPLETE IS INDICATED BY MESSAGE C004 INFORMING THE C.E. TO SELECT OPTIONS.

   E. REMOVE AND SAVE THE PUNCHED CALL CARD.

8. LIST CALL SEEK COUNT (SWITCH 6)

   A. SET CONSOLE ENTRY SWITCH 6, CLEAR ALL OTHERS, AND PRESS START.

   B. MESSAGE D003 WILL BE PRINTED. SAVE THE MESSAGE FOR FUTURE USE.

   C. OPERATION COMPLETE IS INDICATED BY MESSAGE C004 INFORMING THE C.E. TO SELECT OPTIONS.

9. DELETE PATCH CARDS. (SWITCH 7)

   A. SET CONSOLE ENTRY SWITCH 7, CLEAR ALL OTHERS AND PRESS START.

   B. MESSAGE C002 WILL BE PRINTED INFORMING THE C.E. TO ENTER THE PID OF THE PROGRAM WHOSE PATCHES ARE TO BE DELETED VIA CONSOLE ENTRY SWITCHES.

   C. ENTER THE PID IN SWITCHES B THROUGH 15. PRESS START.

   E. THE PROGRAM WILL PRINT MESSAGE C004 INFORMING THE CE TO SELECT OPTIONS.

   NOTE- NO NEW LISTING OF THE PATCH TABLE WILL BE GIVEN. REFER TO SELECT OPTION SWITCH 4 FOR A LISTING OF THE PATCH TABLE.

10. PUNCH CALL PAPER TAPE. (SWITCH B)

   A. SET CONSOLE ENTRY SWITCH B, CLEAR ALL OTHERS.

   B. READY THE 1055 PAPER TAPE PUNCH WITH BLANK TAPE.

   C. PUNCH A TWO INCH LEADER DELETE FIELD. DO NOT PRESS FEED BUTTON.

   D. AT THE 1131 CPU, PRESS START. DIMAL WILL PUNCH THE CALL TAPE.

   E. MESSAGE C004 IS PRINTED INFORMING THE C.E TO SELECT OPTIONS.

   F. REMOVE AND SAVE TAPE.

11. LIST ALL PIDS ON DISK. (SWITCH 9)

   A. SET CONSOLE ENTRY SWITCH 9, CLEAR ALL OTHERS. PRESS START.

   B. MESSAGE D004 -PID TABLE- WILL BE PRINTED. PRESS START FOR A LISTING.

   C. OPERATION COMPLETE IS INDICATED BY MESSAGE C004 INFORMING THE CE TO SELECT OPTIONS.

3.3 DIAGNOSTIC PROGRAM SELECTION AND EXECUTION (SELECT/EXECUTE SECTION)

1. GENERAL OPERATING INSTRUCTIONS

   A. PLACE THE C.E. DISK PACK CONTAINING THE MAINTENANCE LIBRARY ON THE DESIRED DISK DRIVE AND MAKE THE DRIVE READY.

   B. OBTAIN THE CALL CARD OR PAPER TAPE PROVIDED BY DIMAL DURING INITIAL DISK LIBRARY GENERATION. IF ENTRY SWITCH CALL IS DESIRED, REFER TO APPENDIX 6.1.

   C. MAKE THE INPUT DEVICE READY WITH THE CALL CARD OR TAPE.

   D. SET CONSOLE ENTRY SWITCHES TO /XX02 (WHERE XX IS THE DISK DRIVE AREA CODE) TO CALL IN THE SELECT/EXECUTE SECTION.

DISK DRIVE	AREA CODE
CPU	/2002
1	/8B02
2	/9002
3	/9B02
4	/A002

I I. RANDOM - OVERLAP & NON-OVERLAP. I

A. MESSAGE C009 (SELECT PID 00XX) IS PRINTED UPON SUCCESSFUL LOADING OF THE SELECT/EXECUTE SECTION.

IF IT IS DESIRED TO RUN ONE PROGRAM PROCEED TO NEXT STEP, ELSE SKIP TO STEP D.

B. SET /FFXX (WHERE XX IS THE PID OF THE PROGRAM) IN CONSOLE ENTRY SWITCHES 8 THROUGH 15 AND PRESS START. THE PURPOSE OF INCLUDING FF WITH THE PIO IS TO INFORM MONITOR THAT THIS IS THE ONLY PROGRAM SELECTED.

*** VERY IMPORTANT NOTE ***

IF SWITCH 15 IS LEFT ON DUE TO ANY DIMAL SWITCH SETTING THE DIAGNOSTIC MONITOR WILL HALT ALL PROGRAM EXECUTION. TO RESTART ALL PROGRAMS, SET CONSOLE ENTRY SWITCHES TO /0080 AND PRESS INTERUPT REQUEST KEY.

C. UPON COMPLETION OF THE SELECTED PROGRAM RUN, THE DIAGNOSTIC MONITOR WILL RETURN TO DIMAL. DIMAL IN TURN PRINTS MESSAGE C009. THE NEXT PROGRAM MAY BE SELECTED. SEE STEP A ABOVE.

O. IF IT IS DESIREO TO RUN SEVERAL PROGRAMS, THEN ENTER /00XX - XX IS THE PIO - IN CONSOLE SWITCHES 8 THROUGH 15 AND PRESS THE START BUTTON.

E. MESSAGE C010 WILL BE PRINTED ASKING THE CE TO SET SW 0 ON FOR SEQUENTIAL PIDS. THIS IS RANDOM MODE, THEREFORE, SET SW 0 OFF AND PRESS START.

F. THE DIAGNOSTIC MONITOR WILL LOG THE PROGRAM AND RETURN TO DIMAL. DIMAL IN TURN WILL PRINT MESSAGE C009 ASKING FOR THE NEXT PID.

G. ENTER THE NEXT PID AS EXPLAINED IN STEP D. WHEN ITS TIME TO SELECT THE LAST PROGRAM, ENTER /FFXX IN SWS 0 THROUGH 15, ALSO /00FF ENTERED AS LAST PID TELLS DIMAL THAT ALL PROGRAMS HAVE BEEN LOADED.

H. THE DIAGNOSTIC MONITOR WILL LOG ALL THE PROGRAMS SELECTED ANO WILL AUTOMATICALLY RUN THEM IN OVERLAP MODE IF CORE IS AVAILABLE. REFER TO DIAGNOSTIC MONITOR DOCUMENTATION FOR AVAILABLE OPTIONS.

I. UPON COMPLETIDN OF OVERLAP OPERATION, THE DIAGNOSTIC MONITOR WILL NOT RETURN TO DIMAL. TO RETURN TO DIMAL, USE MONITOR SWITCH SETTING /8080.

E. IPL THE CALL CARO OR PAPER TAPE.

F. THE CALL WILL FIRST LOAD THE OIMAL HEADER TESTS. IF THE HEAOER TESTS RUN SUCCESFULLY (RUN TIME APPROXIMATELY 1 SEC) THE COLD START LOADER WILL BE BROUGHT INTO CORE AND IT IN TURN WILL LOAD THE OIMAL SELECT/EXECUTE SECTION.

IF AN ERROR WAIT OCCURS, REFER TO SECTION 6.2 FOR ERROR PROCEDURE.

G. SUCCESSFUL LOADING OF THE SELECT/EXECUTE SECTION IS INDICATEO BY MESSAGE C009.

REFER TO SECTIONS 3.3.2 OIAGNOSTIC MONITOR II PROGRAMS SELECTION OR 3.3.3 NON MONITOR PROGRAMS SELECTION FOR THE REMAINDER OF THE OPERATING PROCEDURES.

I NOTE TO C.E. I

---------OEFINITIONS ---------

RANDOM---PIDS ARE EXECUTED IN THE ORDER SELECTEO.

WARNING
2250 DISPLAY PROGRAMS SHOULO NOT BE SELECTED TO RUN UNDER RANDOM MODE CONTROL.

SEQUENTIAL---PIDS ARE EXECUTED FROM THE LOWEST SELECTED PIO THROUGH THE HIGHEST SELECTED PIO.

2. DIAGNOSTIC MONITOR II PROGRAMS SELECTIONS.

THERE ARE TWO CATEGORIES OF PROGRAM SELECTIONS -

I. RANDOM - OVERLAP & NON-OVERLAP.
II. SEQUENTIAL - OVERLAP & NON OVERLAP.

REFER TO THE CATEGORY OF INTEREST FOR OPERATING INSTRUCTIONS.

II. SEQUENTIAL- OVERLAP & NON OVERLAP.

A. MESSAGE C009 -SELECT PID (00XX)- IS PRINTED UPON SUCCESSFUL LOADING OF THE SELECT/EXECUTE SECTION.

B. SET THE PID OF THE DESIRED PROGRAM IN CONSOLE SWITCHES 8 THROUGH 15. PRESS THE START BUTTON.

C. MESSAGE C010 WILL BE PRINTED ASKING THE CE TO SET SW 0 ON FOR SEQUENTIAL PROCESSING OF PIDS.

D. SET SW 0 ON AND PRESS START.

E. MESSAGE C011 WILL BE PRINTED REQUESTING LAST PID IN SEQUENCE.

F. ENTER THE LAST PID IN SWITCHES 8 THROUGH 15. PRESS START. (OVERLAP OR NONOVERLAP)

G. MESSAGE C012 WILL BE PRINTED ASKING FOR MODE OF OPERATION.

H. SET SW 15 OFF FOR NON OVERLAP AND ON FOR OVERLAP THEN PRESS START

*** VERY IMPORTANT NOTE ***

IF SWITCH 15 IS LEFT ON DUE TO ANY DIMAL SWITCH SETTING THE DIAGNOSTIC MONITOR WILL HALT ALL PROGRAM EXECUTION. TO RESTART ALL PROGRAMS, SET CONSOLE ENTRY SWITCHES TO /0080 AND PRESS INTERUPT REQUEST KEY.

I. THE DIAGNOSTIC MONITOR WILL LOG EACH PROGRAM LOADED INTO CORE AND EXECUTE IT. HOWEVER IF SWITCH 15 WAS SET TO ON IN STEP H THEN ALL PROGRAMS WILL BE LOADED INTO CORE BEFORE EXECUTION OF ANY PROGRAM STARTS.

WHENEVER MORE THAN ONE PROGRAM AT A TIME IS IN CORE MONITOR WILL AUTOMATICALLY RUN THEM IN OVERLAP MODE.

REFER TO DIAGNOSTIC MONITOR DOCUMENTATION FOR AVAILABLE OPTIONS AND OPERATING PROCEDURES.

J. UPON COMPLETION OF NON OVERLAP RUNS DIMAL WILL PRINT MESSAGE C009. THE NEXT PROGRAM MAY NOW BE SELECTED. UPON COMPLETION OF OVERLAP RUNS, DIMAL CONTROL IS LOST. TO REGAIN CONTROL, SET THE I-REG TO /0078 AND PRESS START. MESSAGE C009 WILL PRINT AND THE NEXT PROGRAM(S) MAY NOW BE SELECTED.

3. NON MONITOR PROGRAMS SELECTION

THERE ARE TWO CATEGORIES OF PROGRAM SELECTIONS-

I. RANDOM.
II. SEQUENTIAL.

REFER TO THE CATEGORY OF INTEREST FOR OPERATING INSTRUCTIONS.

I. RANDOM

A. MESSAGE C009 SELECT PID (00XX) IS PRINTED UPON SUCCESSFUL LOADING OF THE DIMAL SELECT/EXECUTE SECTION.

B. SET THE PID OF THE DESIRED PROGRAM IN CONSOLE SWITCHES 8 THROUGH 15 AND PRESS START.

C. MESSAGE C010 WILL BE PRINTED INFORMING THE C.E. TO SET SWITCH 0 ON FOR SEQUENTIAL PIDS. THIS IS RANDOM MODE, THEREFORE, SET SW 0 OFF AND PRESS START. CONTROL IS NOW TRANSFERED TO THE SELECTED PROGRAM.

D. UPON COMPLETION OF THE SELECTED TEST, DIMAL WILL PRINT MESSAGE C009 TO SELECT PID. ANOTHER PROGRAM MAY BE SELECTED NOW.

NOTE- IF THE PROGRAM SELECTED IS NOT DIMAL COMPATIBLE--MEANING IT DOES NOT PROVIDE A BRANCH TO LOCATION /0078 IN DIMAL- CONTROL WILL BE LOST AND MESSAGE C009 WILL NOT BE PRINTED. TO REGAIN CONTROL, SET THE I-REG TO /007B AND PRESS START. IF THIS PROCEDURE FAILS, RECALL DIMAL WITH THE CALL CARD OR PAPER TAPE.

II. SEQUENTIAL.

A. MESSAGE C009 SELECT PID (00XX) IS PRINTED UPON SUCCESSFUL LOADING OF THE DIMAL SELECT/EXECUTE SECTION.

B. SET THE PID OF THE DESIRED PROGRAM IN CONSOLE SWITCHES 8 THROUGH 15 AND PRESS START.

C. MESSAGE C010 WILL BE PRINTED INFORMING THE C.E. TO SET SWITCH 0 ON IF SEQUENTIAL PIDS ARE TO BE PROCESSED

D. SET SW 0 TO THE ON POSITION AND PRESS START.

E. MESSAGE C011 IS PRINTED REQUESTING THE LAST PID IN SEQUENCE.

F. ENTER LAST PID OF SEQUENCE IN SWITCHES 8 THROUGH 15. PRESS START.

G. THE PROGRAMS WILL NOW BE EXECUTED ONE AT A TIME PROVIDED THAT EACH PROGRAM RETURNS TO LOCATION /0078 (DIMAL COMPATIBLE) AT THE END OF EXECUTION.

NOTE- IF THE PROGRAM SELECTED IS NOT DIMAL COMPATIBLE--MEANING IT DOES NOT PROVIDE A BRANCH TO LOCATION /0078 IN DIMAL- CONTROL WILL BE LOST AND MESSAGE C009 WILL NOT BE PRINTED. TO REGAIN CONTROL, SET THE I-REG TO /0078 AND PRESS START. IF THIS PROCEDURE FAILS, RECALL DIMAL WITH THE CALL CARD OR PAPER TAPE.

H. UPON COMPLETION OF ALL THE PROGRAMS IN THE SEQUENCE, DIMAL WILL PRINT MESSAGE C009 TO SELECT PID. A NEW PID MAY NOW BE SELECTED.

I 3.4 PROGRAM WAITS I

PROGRAM WAITS IN DIMAL ARE IDENTIFIED BY REFERENCING THE B REG.

THE WAITS MAY BE DIVIDED INTO FIVE GROUPS-

1. NORMAL WAIT AFTER TYPED MESSAGES (B-REG=/3000).

2. CARD READER FAILURE WAIT B-REG=/30F5.

   2.1 REMOVE CARDS FROM HOPPER.
   2.2 NPRO CARD FROM FEED PATH.
   2.3 PLACE LAST TWO CARDS IN STACKER IN FRONT OF HOPPER CARDS AND READY INPUT DEVICE.

3. FAILURE WAITS IN HEADER TEST OR COLD START LOADER. REFER TO APPENDIX SECTION 6.2 FOR EXPLANATION OF WAITS.

4. FAILURE WAITS IN THE LOADER/ORGANIZER SECTION. EXPLANATION OF WAITS AND CORRECTIVE ACTIONS ARE GIVEN BELOW.

WAIT	EXPLANATION	ACTION
30A1	THIS WAIT INDICATES THAT THERE ARE NO MORE AVAILABLE CYLINDERS ON WHICH TO STORE THE DIAGNOSTIC FUNCTION TESTS.	IF THERE HAS BEEN A LARGE AMOUNT OF DELETE PROGRAM ACTIVITY ON THE DIMAL PACK, RELOADING ALL DFT'S WILL BE NECESSARY TO MAKE MORE CYLINDERS AVAILABLE.
30A2	THIS WAIT INDICATES THAT PATCHES EXCEEDED ONE CYLINDER IN LENGTH (2560 WORDS).	SOME PATCHES MUST BE DELETED OR NO MORE PATCHED PROGRAMS ARE ALLOWED TO BE ADDED TO THE PACK. REFER TO SECTION 3.2.9 FOR DELETE PATCH PROCEDURE.
30E1	THIS WAIT INDICATES THAT A DSW ERROR EXISTED ON EACH OF 3 ATTEMPTS TO READ THE SECTOR ID.	RELOAD THE PROGRAM. THE CYLINDER ON WHICH THE ATTEMPTED READ WAS BEING MADE WILL BE BYPASSED.

30E3	THIS WAIT INDICATES THAT A DSW ERROR EXISTED ON EACH OF 3 ATTEMPTS TO WRITE ON THE DISK.	RELOAD THE PROGRAM. THE CYLINDER ON WHICH THE ATTEMPTED WRITE WAS BEING MADE WILL BE BYPASSED.

5. FAILURE WAITS IN THE SELECT/EXECUTE SECTION. EXPLANATION OF WAITS AND CORRECTIVE ACTIONS ARE GIVEN BELOW.

WAIT	EXPLANATION	ACTION
30E4	THIS WAIT INDICATES THAT A DSW ERROR EXISTED ON EACH OF 3 ATTEMPTS TO WRITE ON THE DISK.	RELOAD THE PROGRAM. THE CYLINDER ON WHICH THE ATTEMPTED WRITE WAS BEING M&DE WILL BE BYPASSED.
30E5	THIS WAIT INDICATES THAT A DSW ERROR EXISTED ON EACH OF 3 ATTEMPTS TO READ DISK.	IF IT IS DESIRED TO EXECUTE THOSE PROGAMS LOADED, PRESS START. IF THAT FAILS RECALL THE SELECT/ EXECUTE.

I 3.5 RESTART PROCEDURE I

1. DIMAL INITIAL LOADER SECTION

THERE IS NO RESTART PROCEDURE DURING THE IPL OPERATION. RESTART IS AVAILABLE ONCE THE INITIAL LOADER IS IN CORE.

2. DIMAL COLD START LOADER SECTION

DEPRESS STOP, RESET AND START. THE COLD START LOADER WILL ATTEMPT A RELOAD OF THE SPECIFIED DIMAL SECTION.

3. DIMAL LOADER/ORGANIZER SECTION

A. INITIAL DISK PACK GENERATION.

THERE IS NO RESTART PROCEDURE DURING THIS PHASE.

-SUGGESTION-

LOAD ONLY ONE PROGRAM ON DISK DURING THIS PHASE. OTHER PROGRAMS MAY BE ADDED USING THE 'ADD A PROGRAM' OPTION. REFER TO SECTION 3.2.2.

B. DISK PACK MODIFICATION

PRESS STOP, RESET AND START. MESSAGE C004 SHOULD BE PRINTED. OPTIONS MAY NOW BE SELECTED.

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I   4.  DIMAL SELECT/EXECUTE SECTION   I
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A. IF MONITOR IS IN CORE RESTART BY SETTING ENTRY SWITCHES TO /8080 AND PRESSING INTERUPT KEY.

B. IF SELECT/EXECUTE IS IN CORE PRESS STOP, RESET, AND START.

5. DIMAL HEADER SECTION

TO RESTART THE HEADER FROM TEST 1, RE-ENTER THE CALL CARD. REFER TO SECTION 3.2.1 OR 3.3.1.

*** VERY IMPORTANT NOTE ***

IF THE RESTART PROCEDURES FAIL TO PROVIDE THE DESCRIBED RESULTS RECALLING DIMAL WILL BE NECESSARY. REFER TO AREA OF INTEREST IN THE DOCUMENTATION.

4.0 PRINTOUTS

4.1 STATUS MESSAGES

LOADER/ORGANIZER

A003 DISK NOT READY

THIS PRINTOUT INDICATES THAT THE DISK DRIVE IS NOT READY. WAIT UNTIL 'FILE READY' LIGHT COMES ON.

SELECT/EXECUTE

A004 DISK NOT READY

THIS MESSAGE INDICATES THAT THE DISK DRIVE IS NOT READY. WAIT UNTIL 'FILE READY' LIGHT COMES ON.

A005 PROGRAM XX NOT ON DISK

THIS MESSAGE INFORMS THE C.E. THAT THE PROGRAM SELECTED WAS NOT FOUND ON DISK. THE SAME MESSAGE IS PRINTED FOR EACH PID NOT FOUND ON DISK DURING THE SELECTION OF SEQUENTIAL PIDS.

A006 PROGRAM EXCEEDS CORE LIMIT

THIS PRINTOUT INDICATES THAT THE DFT SELECTED EXCEEDS THE MAXIMUM ALLOWABLE LIMIT. ANOTHER PROGRAM MUST BE SELECTED.
ALL PREVIOUSLY SELECTED PROGRAMS SHOULD BE AVAILABLE FOR EXECUTION.

INITIAL LOADER

A007 DISK NOT READY

THIS MESSAGE INDICATES THAT THE DISK DRIVE IS NOT READY. WAIT UNTIL 'FILE READY' LIGHT COMES ON.

4.2 COMMAND MESSAGES

LOADER/ORGANIZER

C001 SET SWS TO /FF00 IF DONE

THIS MESSAGE IS PRINTED BY THE LOADER/ORGANIZER SECTION WHEN THE LAST CARD SEQUENCE HAS BEEN PERFORMED ON INITIAL DISK PACK GENERATION OR WHEN USING THE ADD PROGRAM FEATURE.

IF ALL DESIRED PROGRAMS HAVE BEEN LOADED ON DISK, SET CONSOLE SWITCHES TO FF00 AND PRESS START.

IF MORE PROGRAMS ARE TO BE LOADED, READY THE INPUT DEVICE WITH DFT PROGRAMS AND PRESS START.

C002 ENTER PID (00XX) TO DELETE IN SWS.

THIS PRINTOUT OCCURS AS A RESULT OF SELECTING THE OELETE PROGRAM OPTION. ENTER THE PID OF THE PROGRAM TO DELETE IN SWITCHES 8 THROUGH 15. THE PROGRAM PID WILL BE DELETED. A NEW LOCATION DIRECTORY IS AN AUTOMATIC FUNCTION OF THE DELETE PROGRAM OPTION.

THIS MESSAGE ALSO OCCURS WHEN SELECTING THE 'DELETE PATCH CARD' OPTION.

C004 SELECT OPTIONS

THIS MESSAGE INDICATES THAT THE DIMAL LOADER/ORGANIZER IS READY TO BE USED. SELECT THE OPTION DESIRED (REFER TO SECTION 3.2 FOR OPERATING INSTRUCTIONS) AND PRESS START.

C005 RDY 1442 WITH BLANK CARDS

THIS MESSAGE OCCURS DURING THE PUNCH CALL CARD OPTION. READY THE 1442 CRP WITH BLANK CARDS AND PRESS START. THE CARD PUNCHED IS THE CALL CARD. SAVE THIS CARD.

C006 ENTER INPUT DEVICE 1442,2501,1134.

THIS MESSAGE IS PRINTED DURING THE INITIAL PACK GENERATION AND IN THE LOADER/ORGANIZER PHASE OF DIMAL. ENTER IN THE CONSOLE SWITCHES THE ACTUAL NUMBER IN HEX OF THE DEVICE.

C007 READY THE INPUT DEVICE.

THIS MESSAGE IS PRINTED IN THE LOADER ORGANIZER SECTION WHEN EVER THE INPUT OEVICE GOES NOT READY.

C008 ENTER PID OF PROGRAM TO BE PATCHED VIA SWS.

THIS MESSAGE IS PRINTED DURING SELECT OPTION 2 IN THE LOADER/ ORGANIZER PHASE. REFER TO SECTION 3.2.4.

SELECT/EXECUTE

C009 SELECT PROGRAM PID (00XX)

THIS PRINTOUT INFORMS THE C.E. TO ENTER THE PID OF THE PROGRAM TO BE EXECUTED VIA CONSOLE ENTRY SWITCHES 8 THROUGH 15.

C00A YOU HAVE SELECTED PID XX

THIS MESSAGE FOLLOWS MESSAGES C009 AND C011. IT MERELY TELLS THE CE OF HIS PID SELECTION .

C010 SET SW 0 ON FOR SEQ PIDS.

THIS MESSAGE REQUESTS SETTING SW 0 ON FOR PROCESSING SEQUENTIAL PIDS.

C011 ENTER LAST PID OF SEQ.

THIS MESSAGE FOLLOWS MESSAGE C010 REQUESTING THE LAST PID IN THE SEQUENCE TO BE PROCESSED. ENTER IN SWS 8 THROUGH 15.

C012 SET SW 15 ON FOR OVERLAP.

THIS PRINTOUT OCCURS AFTER MESSAGE C011 INFORMING THE C.E. TO SET SW 15 ON IF HE DESIRES OVERLAP OPERATION.

INITIAL LOADER

C013 READY INPUT DEVICE.

THIS MESSAGE REQUESTS THAT THE INPUT DEVICE BE MADE READY. PLACE THE DIMAL DECK IN THE HOPPER AND PRESS THE READER START BUTTON.

C014 ENTER CE CYLINDER NUMBER.

THIS PRINTOUT OCCURS DURING INITIAL PACK GENERATION. ENTER IN CONSOLE ENTRY SWITCHES /00C7 AND PRESS START.

IMPORTANT NOTE- IF THE CE HISTORY TRACK WAS FOUND TO BE BAD DURING THE RUNNING OF THE DISK INITIALIZATION TEST (PID 0308), THEN THE HISTORY TRACK MUST BE ASSIGNED BY THE CE AND ENTERED IN THE SWITCHES AS EXPLAINED ABOVE.

C015 AREA CODE (XX00).

THIS MESSAGE IS PRINTED OURING INITIAL PACK GENERATION ONLY. ENTER IN THE CONSOLE SWITCHES THE AREA CODE OF THE DISK DRIVE. PRESS START.

4.3 DATA MESSAGES

LOADER/ORGANIZER

D001 LOCATION DIRECTORY

PID	CYL	SECT	TSEC	
02	XXX	0	07	(1)
02	XXX	7	01	(2)
02	XXX	0	10	(3)
	XXX	0		(4)
02	XXX	0	06	(5)
XX	XXX	X	XX	(6)
	XXX	0		(7)

MESSAGE D001 IS THE LISTING OF THE LOCATION DIRECTORY

PID = THE PROGRAM ID
CYL = THE FIRST CYLINDER(IN DECIMAL) ON WHICH THE PROGRAM IS STORED.
SECT = THE FIRST SECTOR ON THE DEIGNATED CYLINDER USED BY THE PROGRAM
TSEC = TOTAL NUMBER OF SECTORS (IN DECIMAL) REQUIRED TO STORE THE PROGRAM.

LINES 1,2,3,4, AND5 (LINE NUMBERS ARE NOT PRINTED) DEFINE THE LOCATION OF THE DIMAL SYSTEM ON THE DISK
LINE I IS THE HEADER TEST LOCATION
LINE 2 IS THE COLD START LOADER LOCATION
LINES 3 + 4 ARE THE LOADER/ORGANIZER SECTION LOCATION.
LINE 5 IS THE SELECT/EXECUTE SECTION LOCATION.

LINE 6 WILL DEFINE THE LOCATION OF THE FIRST DFT LOADED.

LINE 7 WILL BE PRINTED WHEN MORE THAN ONE CYLINDER IS REQUIRED TO STORE THE PROGRAM. SECTOR 0 WILL ALWAYS BE THE FIRST SECTOR USED.

ALL DFT'S WILL BE LISTED IN THE FORMAT OF LINES 6 AND 7. SAVE THE PRINTOUT FOR REFERENCE.

D002 PATCH CARD TABLE

ALL THE PATCHES CONTAINED ON THE DISK PACK ARE LISTED. THE FORMAT FOR THE PRINTOUT IS THE HEXIDECIMAL CONTENT OF EACH PATCH CARD READ. SAVE PRINTOUT FOR REFERENCE. A SAMPLE PRINTOUT IS GIVEN BELOW

A20C 4000 013B 0001 0000 0000 0000 0000 0000 0000 0000 0000

WHERE A2 IS THE PID, 0C IS THE NUMBER OF ITEMS ON EACH CARD PLUS TWO WORDS- THE TWO WORDS ARE THE PID AND RELOCATION FACTOR- 4000 IS THE RELOCATION WORD, 013B IS THE ADDRESS WHERE THE DATA WILL GO. THE REST OF THE CARD IS DATA.

D003 DATA SW CALL SEEK COUNT IS XX

MESSAGE D003 INFORMS THE OPERATOR OF THE SEEK COUNT REQUIRED IN THE BIT SWITCH CALL ROUTINE. THIS NUMBER IS IN HEXIDECIMAL AND SHOULD BE INSERTED AS /00XX.

D004 PID TABLE.

MESSAGE D004 IS THE LISTING OF ALL THE PROGRAMS ON DISK. EACH PID IS GIVEN AS A TWO DIGIT NUMBER. THE FIRST FOUR PIDS (02 02 02 02) ARE THE DIMAL SECTIONS AND WILL ALWAYS APPEAR BEFORE THE OTHER PIDS.

4.4 ERROR MESSAGES

I LOADER/ORGANIZER I

E002 DISK SEEK ERROR, PRESS START

THIS MESSAGE INDICATES THAT A SEEK ERROR HAS OCCURED, PRESS START TO TRY AGAIN. IF ERROR PERSISTS SEVERAL TIMES, REINITIALIZE DISK AND RELOAD DIMAL.

E004 PATCH CARD ERROR

THIS MESSAGE INDICATES THAT A CARD WITH A PUNCH OTHER THAN A '12' PUNCH IN COLUMN 1 OF THE PATCH CARD OR A BLANK CARD HAS BEEN DETECTED. CHECK THE PATCH CARDS AND REENTER AFTER CORRECTIONS.

E005 CHECKSUM ERROR

THIS MESSAGE INDICATES THAT A CHECKSUM ERROR HAS BEEN DETECTED DURING CARD READ OPERATIONS.

REMOVE THE CARDS FROM THE HOPPER. NPRO THE CARDS FROM THE FEED PATH. THE LAST TWO CARDS IN THE STACKER ARE TO BE CORRECTED AND PLACED IN FRONT OF THE CARDS FROM THE HOPPER. RELOAD CARDS & READY INPUT DEVICE. THE FIRST CARD ENTERING THE STACKER IS THE CARD WHICH CAUSED THE CHECKSUM ERROR. CHECKSUM IS CAUSED BY CARDS OUT OF SEQUENCE OR BY FAULTY PUNCHES (TORN, LACED, ETC.). CORRECT THE DECK AND PLACE IN THE HOPPER. DO NOT RELOAD THOSE CARDS WHICH HAVE BEEN ACCEPTED. READY THE CARD READER AND PRESS THE 1131 CPU START.

INCASE OF CONSECUTIVE CHECKSUM ERRORS, THE FOLLOWING PROCEDURE IS RECOMMENDED. REMOVE THE DECK CAUSING THE CONTINUOUS CHECKSUM ERROR. AT THE 1131 CPU, SET CONSOLE SWITCH B AND PRESS START. MESSAGE C007 WILL BE PRINTED. LOAD CARDS IN READER AND MAKE IT READY. THIS EXACT PROCEDURE MUST BE FOLLOWED TO CONTINUE LOADING.

THE DECK CAUSING THE CHECKSUM ERROR MAY BE ADDED LATER AFTER IT HAS BEEN CORRECTED. REFER TO SECTION 3.2.2.

I SELECT/EXECUTE I

E009 PIDS ARE INVERTED.

THIS MESSAGE INDICATES THAT THE LAST PID IN THE SEQUENCE IS LESS THAN THE FIRST PID ENTERED. AT THE 1131 CPU PRESS THE START BUTTON. MESSAGE C009 IS PRINTED ASKING THE CE TO SELECT PID. REENTER THE PID CORRECTLY.

E00A DISK SEEK ERROR. PRESS START.

THIS MESSAGE INDICATES THAT A SEEK ERROR HAS OCCURRED. PRESS START TO TRY AGAIN. IF ERROR PERSISTS SEVERAL TIMES, REINITIALIZE THE DISK AND RELOAD DIMAL.

E00B PIDS ARE INCOMPATIBLE

THIS PRINTOUT OCCURS IF THE LAST PID SELECTED DURING THE SELECTION OF SEQUENTIAL PIDS IS A DIFFERENT TYPE THAN THE FIRST PID ENTERED. ALL MONITOR CONTROLLED PROGRAMS HAVE PIDS LESS THAN 9F. ALL NON-MONITOR PROGRAMS HAVE PIDS GREATER THAN /9F. PRESS THE START BUTTON ON THE 1131 CPU. MESSAGE C009 IS PRINTED (SELECT PID 00XX). REENTER THE PIDS CORRECTLY.

EXAMPLE OF THE ABOVE ERROR-
FIRST PID ENTERED (0031), LAST PID ENTERED (00A1).

I INITIAL LOADER I

E00C DISK SEEK ERROR, PRESS START

THIS MESSAGE INDICATES THAT A SEEK ERROR HAS OCCURED, PRESS START TO TRY AGAIN. IF ERROR PERSISTS SEVERAL TIMES, REINITIALIZE DISK AND RELOAD DIMAL.

E00D DISK WRITE ERROR.

THIS MESSAGE INDICATES THAT A DSW ERROR EXISTED ON EACH OF 3 ATTEMPTS TO WRITE ON THE DISK. THE PROGRAM BEING LOADED AT THE TIME THE ERROR OCCURRED MUST BE RELOADED. THE CYLINDER ON WHICH THE ATTEMPTED WRITE WAS BEING MADE WILL BE BYPASSED.

E00E DISK READ ERROR.

THIS MESSAGE INDICATES THAT A DSW ERROR EXISTED ON EACH OF 3 ATTEMPTS TO READ THE SECTOR ID. THE PROGRAM WHICH WAS BEING LOADED AT THE TIME OF THE ERROR MUST BE RELOADED. THE CYLINDER ON WHICH THE ATTEMPTED READ WAS BEING MADE WILL BE BYPASSED.

E00F WRONG LOADER

THIS MESSAGE INDICATES THAT A WRONG LOADER IS BEING USED ON INPUT DEVICE. CHECK THE LOADER AND RELOAD DIMAL.

E016 END CARD OUT OF ORDER.

THIS PRINTOUT INFORMS THE CE THAT THE DIMAL DECK HAS SOME CARDS OUT OF SEQUENCE. CHECK DIMAL FOR MISSING CARDS. (ESPECIALLY END CARDS, OR FOR OUT OF SEQUENCE CARDS) RELOAD.

E017 CE WORD NOT FOUND ON DISK.

THIS MESSAGE OCCURS IF THE CE WORD (/CEDC) WAS NOT FOUND ON THE CE HISTORY TRACK. PRESS THE 1131 CPU START BUTTON TO SEARCH FOR IT AGAIN. IF THE RETRY FAILS, THE DISK PACK MUST BE REINITIALIZED AGAIN (PID 0308).

E018 DISK HAS MORE THAN 3 BAD CYLINDERS.

THIS MESSAGE INDICATES THAT THERE ARE MORE THAN 3 BAD CYLINDERS ON THE PACK. IT IS RECOMMENDED THAT THE PACK BE REPLACED WITH A NEW PACK. PROCEEDING MAY CAUSE OTHER PROBLEMS.

E019 CHECKSUM ERROR.

THIS MESSAGE INDICATES THAT A CHECKSUM ERROR HAS BEEN DETECTED DURING CARD READ OPERATIONS.

AT THE CARD READER, REMOVE THE CARDS FROM THE HOPPER. DEPRESS THE NPRO BUTTON. THE FIRST CARD ENTERING THE STACKER IS THE CARD WHICH CAUSED THE CHECKSUM ERROR. CHECK IF THAT CARD WAS IN CORRECT SEQUENCE (IMPROPER SEQUENCE WILL CAUSE CHECKSUM ERRORS). IF CARDS WERE OUT OF SEQUENCE, CORRECT AND PLACE IN THE READ HOPPER. DO NOT RELOAD THOSE CARDS WHICH HAVE BEEN ACCEPTED. READY THE READER AND PRESS CPU START BUTTON.

I 5. COMMENTS I

THE DIMAL SYSTEM IS DIVIDED INTO 5 MAJOR SECTIONS

1. DIMAL INITIAL LOADER
2. DIMAL HEADER SECTION
3. DIMAL COLD START LOADER
4. DIMAL LOADER/ORGANIZER SECTION
5. DIMAL SELECT/EXECUTE SECTION

5.1 INITIAL LOADER

THE INITIAL LOADER FUNCTION IS TO INPUT THE DIMAL OBJECT DECK, WRITE IT ON THE DISK AND THEN CALL IN THE COLD START LOADER WHICH IN TURN INPUTS THE LOADER/ORGANIZER SECTION. THE LOADER/ORGANIZER SECTION IS THEN USED TO INPUT THE DFT'S FOR INCLUSION ON THE DISK PACK.

THE INITIAL LOADER WILL MAKE A CHECK TO INSURE THAT THE C.E. PACK HAS BEEN PLACED ON THE SPECIFIED DRIVE. THIS IS DONE BY READING SECTOR 3 OF THE HISTORY TRACK AND CHECKING WORD 2 FOR /CEDC. THE LOADER WILL THEN DEFINE THE FIRST EIGHT USABLE CYLINDERS, STARTING AT CYLINDER 6, AS THE DIMAL CYLINDERS. THESE CYLINDERS ARE USED AS FOLLOWS-

1ST CYLINDER - HEADER TEST AND COLD START LOADER.
2ND CYLINDER - LOADER/ORGANIZER
3RD CYLINDER - LOADER/ORGANIZER
4RD CYLINDER - SELECT/EXECUTE SECTION
5TH CYLINDER - WORK CYLINDER 1
6TH CYLINDER - WORK CYLINDER 2
7TH CYLINDER - LOCATION DIRECTORY
8TH CYLINDER - PATCH CARDS

THE ADDRESSES FOR THESE CYLINDERS WILL BE PLACED IN A USE TABLE. THE USE TABLE WILL BE INCLUDED IN THE COLD START LOADER, LOADER/ORGANIZER SECTION AND THE SELECT/EXECUTE SECTION PRIOR TO WRITING THESE SECTIONS ON THE DISK.

THE DIMAL DECK IS THEN READ IN AND STORED ON THE DISK AT THE ASSIGNED CYLINDERS. UPON COMPLETION OF THE LOADER OPERATION THE INITIAL LOADER WILL WRITE THE WORD /ABCD ON SECTOR 0 OF THE HISTORY TRACK TO DEFINE THE DISK PACK AS CONTAINING DIMAL. THE LOADER THEN CALLS INTO CORE, THE COLD START LOADER AND SETS UP THE NECESSARY CONTROL TO BRING IN THE LOADER/ORGANIZER SECTION. THE INITIAL LOADER THEN BRANCHES TO THE COLD START LOADER WHICH INPUTS THE LOADER/ORGANIZER SECTION AND GIVES CONTROL TO IT.

5.2 DIMAL HEADER SECTIONS

THE PURPOSE OF THE HEADER SECTIONS IS TO TEST MOST OF THE 1130 INSTRUCTION SET. EACH TEST OCCUPIES ONE SECTOR OF THE FIRST DIMAL CYLINDER.

THE FOLLOWING INSTRUCTIONS ARE NOT CHECKED BY THE HEADER SECTION.

	MULTIPLY (M)
DOUBLE ADD (AD)	DIVIDE (D)
DOUBLE SUBSTRACT (SD)	EXECUTE I/O (XIO)

TEST 1

CHECKS OPERATION OF MDX, BSC AND EOR SHORT FORM. CHECKS THE ABILITY OF THE A REG TO HOLD 1'S, TO LOAD 1'S ON TOP OF 1'S AND TO LOAD 0'S ON TOP OF 1'S. ALSO CHECKED IS THE FLAG BIT AND INDIRECT ADDRESSING.

TEST 2

CHECKS DATA ENTRY SWITCHES. CHECK INSTRUCTION BSI, SRA, AND, OR, MDX LONG, RTE AND SRT.

TEST 3

CHECKS INSTRUCTIONS RTE, SLA, SLT, STO AND STS.

TEST 4

CHECKS INSTRUCTIONS BSC, BSI AND LDX.

TEST 5

CHECKS INSTRUCTIONS LDX, STX AND A.

TEST 6

CHECKS INDEXING, BSC INDEXED, MDX, AND SUBTRACT INSTRUCTIONS

TEST 7

CHECKS INSTRUCTIONS SLC, SLCA, LDD, AND STD.

THE HEADER SECTION CONTAINS THE CONTROL NECESSARY FOR LOOPING ERRORS, LOOPING INSTRUCTIONS, AND BYPASSING ERROR WAITS DURING TROUBLE SHOOTING. REFER TO SECTION 6.2 FOR HEADER TEST ERROR PROCEDURES.

5.3 COLD START LOADER

IT IS THE FUNCTION OF THE COLD START LOADER TO INPUT THE DIMAL SECTION SPECIFIED BY THE COLD START CALL CARD OR TAPE.

DURING INITIAL DIMAL DISK PACK GENERATION, THE INITIAL LOADER CALLS THE COLD START LOADER TO INPUT THE LOADER/ORGANIZER SECTION OF DIMAL.

DURING ONE CARD, PAPER TAPE, OR CONSOLE ENTRY SWITCH CALLS, THE COLD START LOADER IS BROUGHT INTO CORE BY HEADER TEST 7 AFTER SUCCESSFUL OPERATION OF THE HEADER SECTION. THE COLD START LOADER THEN REFERENCES A CONSTANT CONTAINED IN THE CALL (LOCATION /000F) TO DETERMINE WHICH DIMAL SECTION TO LOAD. IT WILL LOAD THAT SECTION AND BRANCH TO IT.

THE COLD START LOADER IS STORED ON SECTOR 7 OF THE FIRST DIMAL CYLINDER AND IS LOADED INTO CORE AT LOCATION /0DAC.

5.4 DIMAL LOADER/ORGANIZER SECTION

IT IS THE FUNCTION OF THE LOADER/ORGANIZER SECTION TO INPUT THE DIAGNOSTIC PROGRAMS AND WRITE THEM ON THE DISK PACK. THIS SECTION IS ALSO USED TO MODIFY A PREVIOUSLY GENERATED DIMAL PACK.

THE LOADER/ORGANIZER SECTION IS CALLED FROM DISK BY THE INITIAL LOADER.

WHEN GENERATING A NEW PACK, THIS SECTION WILL FIRST UPDATE THE LOCATION DIRECTORY TO INCLUDE THE LOCATION OF THE DIMAL SYSTEM ON THE DISK PACK. THE SECTION THEN PREPARES TO INPUT THE PROGRAM DECKS. PRIOR TO USING ANY CYLINDER FOR PROGRAM STORAGE, THE CYLINDER IS CHECKED FOR A USABLE CONDITION. ALL BAD CYLINDERS ARE BYPASSED. A BAD CYLINDER IS DEFINED AS A CYLINDER WHERE ALL SECTORS CAN'T BE PROPERLY WRITTEN AND READ.

THE PROGRAMS ARE STORED ON DISK ACCORDING TO THE FOLLOWING SCHEME.

A) PROGRAMS WITH PIDS GREATER THAN /009F, ARE NON MONITOR DEPENDENT PROGRAMS AND ARE STORED ON DISK IN CORE IMAGE, 320 WORDS PER SECTOR.
B) PROGRAMS WITH PIDS LESS THAN /009F, ARE MONITOR DEPENDENT PROGRAMS AND ARE STORED ON DISK IN CARD IMAGE, 4 CARDS PER SECTOR.

*** VERY IMPORTANT NOTE ***

MONITOR CONTROLLED PROGRAMS (PIDS 9F AND LESS) SHOULD NOT HAVE MORE THAN 256 CARDS PER DECK.

THE IMAGE USED IS ENTERED IN THE IMAGE INDICATOR (0=CORE IMAGE, 1 = CARD IMAGE) WHICH IS CONTAINED IN THE LOCATION DIRECTORY ENTRIES FOR EACH PROGRAM.

CARD 1 (HEADER CARD) OF THE 12-4 DECKS IS NOT STORED ON THE DISK NOR ARE THE CARDS WHICH CONTAIN THE WAIT OR TRAP CONSTANTS USED IN THE WAIT DESCRIPTION AT THE FRONT OF THE PROGRAM LISTING. THESE ARE IDENTIFIED BY ADDRESS STARTING AT 3001 OR 7001.

WHEN WRITING PROGRAMS ON DISK IN CORE IMAGE, ALL BLOCKS OF STORAGE RESERVED BY THE PROGRAM (DEFINED BY BSS STATEMENTS) ARE WRITTEN AS ZEROS ON DISK.

THE NUMBER OF SECTORS USED, THE ADDRESSES OF ALL CYLINDERS USED, THE PROGRAM ORG ADDRESS AND THE PROGRAM TRANSFER ADDRESS ARE SAVED FOR INCLUSION IN THE LOCATION DIRECTORY.

THE LOCATION DIRECTORY IS UPDATED FOR EACH PROGRAM UPON ENTERING /FF00 IN THE ENTRY SWITCHES. THE LOCATION DIRECTORY FORMAT FOLLOWS -

```
 0            7 8                 15
**************************************
* PROGRAM PID  * TYPE                *
**************************************
* TOTAL SECTORS* TOTAL CYLINDERS     *
**************************************
* ORG.  ADDRESS                      *
**************************************
* 1ST CYLINDER ADDRESS               *
**************************************
* 2ND CYLINDER ADDRESS               *
**************************************
* 3RD CYLINDER ADDRESS               *
**************************************
* 4TH CYLINDER ADDRESS               *
**************************************
* 5TH CYLINDER ADDRESS               *
**************************************
* 6TH CYLINDER ADDRESS               *
**************************************
* 7TH CYLINDER ADDRESS               *
**************************************
* 8TH CYLINDER ADDRESS               *
**************************************
* PROGRAM TRANSFER ADDRESS           *
**************************************
```

BIT 15 OF THE FIRST ENTRY IS THE IMAGE INDICATOR DESCRIBED PREVIOUSLY.

IF A PROGRAM DOES NOT REQUIRE 8 CYLINDERS FOR STORAGE, THEN ZEROS ARE PLACED AS ADDRESSES. REGARDLESS OF HOW MANY CYLINDERS USED, THE FORMAT OF THE TABLE WILL ALWAYS BE THE SAME. (TWELVE ENTRIES PER TABLE).

IF A PROGRAM HAS PATCH CARDS BEHIND IT, THE PATCH CARDS WILL BE ENTERED IN THE PATCH TABLE ALONG WITH THE PID OF THAT PROGRAM. ALL PREVIOUS PATCHES FOR THAT PID WILL BE DELETED.

AS EACH NEW PROGRAM IS READ IN, IT WILL BE WRITTEN ON THE NEXT AVAILABLE SECTOR. THEREFORE A PROGRAM MAY START ON ANY SECTOR OF THE CYLINDER PRESENTLY BEING USED. AFTER SECTOR 7 HAS BEEN WRITTEN, PROGRAM STORAGE WILL CONTINUE ON THE NEXT SEQUENTIAL AVAILABLE CYLINDER, SECTOR ZERO. TRACKS 90-110 AND 199 ARE NOT USED.

WHEN ALL PROGRAMS HAVE BEEN WRITTEN ON THE DISK, THE LOADER/ORGANIZER SECTION WILL SAVE THE NEXT AVAILABLE STORAGE SECTOR BY WRITING ITS ADDRESS ON SECTOR 0, WORD 3 OF THE CE HISTORY TRACK. THE SECTION THEN LISTS THE CONTENTS OF THE LOCATION DIRECTORY AND PRINTS A SEEK COUNT TO BE USED WHEN ENTERING THE CALL VIA THE ENTRY SWITCHES

SUBROUTINE DLPGM IS USED TO DELETE PROGRAMS. THIS SUBROUTINE REMOVES ALL ENTRIES FROM THE LOCATION DIRECTORY WHICH PERTAIN TO THE PID SPECIFIED TO BE DELETED. A NEW LISTING OF THE LOCATION DIRECTORY FOLLOWS AUTOMATICALLY. (THE PROGRAM ITSELF IS NOT ERASED FROM THE DISK, ONLY THE LOCATION DIRECTORY ENTRIES).

5.5 DIMAL SELECT/EXECUTE SECTION

*** NOTE ***

INTERRUPT REQUEST KEY AND START BUTTON PERFORM THE SAME FUNCTION IN THIS SECTION.

THE PURPOSE OF THIS SECTION IS TO CALL INTO CORE, FROM DISK, THE DIAGNOSTIC PROGRAM SPECIFIED BY THE OPERATOR.

THE SELECT/EXECUTE SECTION IS CALLED INTO CORE BY AN IPL CALL CARD, A PAPER TAPE CALL STRIP, OR A CALL ROUTINE ENTERED VIA THE SWITCHES.

THE SELECT/EXECUTE SECTION IS DIVIDED INTO TWO PARTS, A RESIDENT PORTION, AND THE MAIN BODY OF THE SECTION.

THE RESIDENT PORTION PERMANENTLY RESIDES IN CORE FROM LOCATION /001F THROUGH /0160 . ALL PROGRAMS WHICH RETURN TO DIMAL WILL DO SO VIA THE INTERFACE ENTERING AT LOCATION /0078. THE MAIN PORTION OF DIMAL ALSO ENTERS THE RESIDENT PORTION TO LOAD ABSOLUTE PROGRAMS OR PRIOR TO TRANSFERING CONTROL TO A MONITOR PROGRAM.

THE MAIN BODY OF THE SELECT/EXECUTE SECTION SHARES CORE LOCATIONS /0160 TO /05DC WITH EITHER MONITOR OR A NON MONITOR PROGRAM

WHEN A PROGRAM HAS BEEN ENTERED IN THE CONSOLE ENTRY SWITCHES FOR SELECTION, THE DIMAL SECTION WILL DETERMINE WHETHER THE PROGRAM IS MONITOR DEPENDENT OR STAND-ALONE, NON MONITOR DEPENDENT.

I STAND ALONE PROGRAMS I

IF A STAND-ALONE PROGRAM IS BEING REQUESTED, THE SELECT/EXECUTE SECTION WILL SEARCH THE LOCATION DIRECTORY FOR THAT PID. WHEN THE PID IS FOUND, IT'S LOCATION ON DISK WILL BE STORED IN THE RESIDENT SECTION AND CONTROL GIVEN TO THE RESIDENT SECTION.

THE RESIDENT SECTION WILL INPUT THE SELECTED DIAGNOSTIC PROGRAM AND BRANCH TO IT. DIMAL CONTROL IS LOST AT THIS POINT UNLESS THE PROGRAM PROVIDES A BRANCH TO LOCATION /0078.

THE DIMAL SECTION MAY BE RELOADED BY SETTING THE I REG TO HEX /0078 AND CONTINUING FROM THAT POINT. IF SEQUENTIAL PIDS ARE TO BE EXECUTED, THE SELECTION OF THE NEXT PID IS AUTOMATIC.

DIAGNOSTIC MONITOR DEPENDENT PROGRAMS

DIMAL IN NO WAY AFFECTS THE OPERATION OF THE DIAGNOSTIC MONITOR.

WHEN THE PID ENTERED IN THE CONSOLE ENTRY SWITCHES IS A DIAGNOSTIC MONITOR DEPENDENT PROGRAM, THE DIMAL SECTION WILL PUT MONITOR ON WORKING CYLINDER ZERO.

DIMAL WILL LOCATE THE SELECTED PROGRAM ON DISK, LOAD IT INTO CORE, RELOCATE IT, EFFECT A CORE SWAP OF DIMAL AND MONITOR, AND BRANCH TO THE PROGRAM JUST LOADED.

UPON PROGRAM TERMINATION, THE MONITOR WILL RETURN TO THE INTERFACE SECTION, AGAIN THE CORE SWAP WILL OCCUR AND THE DIMAL SECTION WILL SET UP TO ALLOW SELECTION OF THE NEXT DIAGNOSTIC PROGRAM.
IN THE OVERLAP MODE OF OPERATION, THE DM WILL RETURN TO DIMAL AFTER EACH PROGRAM HAS BEEN LOADED FOR THE NEXT PROGRAM SELECTION. TO INDICATE THAT THE LAST PROGRAM IS LOADED, SWITCHES 8 THROUGH 15 SHOULD BE SET TO 00FF.

TO RETURN TO DIMAL FROM OVERLAP OPERATIONS, REFER TO MONITOR -LOAD PROGRAM OPTION.

6. APPENDIX

6.1 CONSOLE ENTRY SWITCHES CALL ROUTINE.

THIS ROUTINE MAY BE USED TO CALL DIMAL FROM DISK TO CORE STORAGE. TO ENTER THE CALL ROUTINE PROCEED AS FOLLOWS-

1. MOUNT THE DIMAL PACK AS EXPLAINED IN SECTION 3.3.1.
2. SET THE MODE SWITCH TO LOAD.
3. INSURE THAT THE I COUNTER IS AT /0014.
4. ENTER THE HEX INSTRUCTIONS PROVIDED ON THE NEXT PAGE IN THE ENTRY SWITCHES PRESSING THE START BUTTON AFTER EACH ENTRY.

*** VERY IMPORTANT NOTE ***

MAKE SURE THAT YOU ENTER THE CALL SEEK COUNT IN LOCATION /004A OF THIS ROUTINE.

5. AFTER ALL THE INSTRUCTIONS HAVE BEEN ENTERED, SET THE BEGINNING ADDRESS /0019 IN THE CONSOLE ENTRY SWITCHES, PRESS THE LOAD IAR BUTTON. SET THE MODE SWITCH TO RUN, PRESS START.
6. THE ROUTINE WILL WAIT (300A) AT LOCATION /0021 SET DISK AREA CODE IN ENTRY SWITCHES 0-B AT THIS WAIT.
7. THE ROUTINE WILL WAIT (300C) AT LOCATION /0025 SET THE CALL CODE AT THE WAIT. THE CODE IS /0001 FOR LOADER ORGANIZER, /0002 FOR SELECT EXECUTE.

CALL ROUTINE

```
LOCATION*INSTRUCTIONS*LABEL*OPER*FT*OPERANO + REMARKS
0014     0000         INTP  OC      *-*
0015     0C00  0046         XIO   L  RESAT-1   SENSE-NORESET

0017     4CC0  0014         BOSC  I  INTP      RESET INTR +EXIT

0019     6500  0014         LOX   L1 INTP      PICKUP INTR VCTR

001B     6000  000A         STX   L1 /000A     STORE IN LOC A

0010     6500  0141         LOX   L1 /0141     LOAD WORD COUNT

001F     6000  004E         STX   L1 /004E     STORE IN LOC 4E

0021     300A               WAIT     /A        ENTER AREA CODE
0022     0807               XIO      RBITS     READ DATA ENT SW
0023     C008               LO       AORS      LOAO CONTENTS
0024     00E9               STO      /000E     STORE IN LOC E
0025     300C               WAIT     /C        ENTER TYPE OF CALL
0026     0803               XIO      RBITS     REAO OATA ENT SW
0027     C004               LD       AORS      LOAO CONTNETS
0028     00E6               STO      /000F     STORE IN LOC F
0029     7003               MOX      BOOT2     BR. AROUNO CONST
002A     002C         RBITS OC       ADRS
002B     3A00               DC       /3A00     REAO OES IOCC
002C     0000         AORS  OC       *-*
002D     0818         BOOT2 XIO      RESAT-1   SENSE DISK STATUS
002E     1002               SLA      2         TEST FOR REAOY NOT BUSY
002F     4808               BSC      +         SKIP IF OFF
0030     70FC               MOX      BOOT2     LOOP UNTIL REAOY
0031     1802               SRA      2         TEST FOR 13S0
0032     4804               BSC      E         13S0 IF BIT OFF
0033     7005               MOX      B44SD     ELSE BRANCH
0034     0813         B13SO XIO      SEEKB-1   ISSUE SEEK HOME COMMAND
0035     3002               WAIT
0036     1004         XTAG1 SLA      4         POSITION HOME BIT
0037     4810               BSC      -         SKIP IF ON
0038     70FB               MDX      B13SO     LOOP UNTIL DISK IS HOME
0039     0810         B44SD XIO      SEEKT-1   SEEK TO OESIRED CYLINOER
003A     3003               WAIT     3
003B     0810               XIO      REE0-1    READ ONE SECTOR
003C     3004               WAIT     4
0030     C00C               LO       SEEKT-1   TEST FOR CORRECT CYL POSITION
003E     1003               SLA      3         POSITION BITS
003F     F00F               EOR      BOOT1+79  CHECK FOR PROPER AOORESS
0040     4820               BSC      Z         IF YES SKIP
0041     70F2         XTAG2 MDX      B13S0     ELSE RETRY
0042     C0F3               LO       XTAG1     GET A 'NOP' INSTRUCTION
0043     00F0               STO      XTAG2     CHANGE ABOVE 'MOX' TO A 'NOP'
0044     700C               MOX      BOOT1+81  BRANCH TO 1ST HEAOER TEST
0045     0000               OC       *-*
0046     0000               OC       *-*
0047     2701         RESAT OC       /2701     SENSE AND RESET IOCC
0048     0001               DC       1
0049     2404         SEEKB DC       /2404     SEEK HOME IOCC
004A     0000               OC       *-*
004B     2400         SEEKT DC       /2400     SEEK FORWARO IOCC
004C     004E               DC       /004E     WORO COUNT ADORESS
0040     2600         REE0  OC       /2600     REAO IOCC
```


6.2 OIMAL HEAOER TEST ERROR PROCEOURE

THE HEAOER TEST IS OIVIOEO INTO 7 TEST SECTIONS (TESTS 1 THROUGH 7). EACH TEST SECTION HAS ITS OWN PROGRAM LISTING. TOGETHER THESE TESTS COMPRISE AN ABREVIATION OF THE CPU FINCTION TEST. WHEN AN ERROR PERSISTS USE THE CPU FUNCTION TEST PID 03A1 TO CORRECT THE PROBLEM.

TABLE 2 SHOWS THE FUNCTIONS OF DATA ENTRY SWITCHES 0 AND 1 IN PROVIDING ERROR ROUTINE CONTROL. SET THE SWITCHES AS OESIREO WHEN AN ERROR WAIT IS ENCOUNTERED.

TABLE 2
HEAOER TEST ERROR PROCEOURE OPTIONS

CONSOLE ENTRY SWITCH 0 1 2 3 4 5 6 7 8 9	OESCRIPTION
. .	
. 1	LOOP INSTRUCTION
1	BYPASS ERROR WAIT
. .	
. .	
0 0	RETRY FAILING INSTRUCTION AND HALT IF ERROR OCCURS. PROGRAM WILL PROCEEO IF FAILURE OOES NOT REOCCUR.
. .	
1 0	RETRY FAILING INSTRUCTION ANO BYPASS HALT IF ERROR OCCURS. PROGRAM WILL PROCEEO IF FAILURE OOES NOT REOCCUR
. .	
0 1	CONTINUOUS LOOP ON INSTRUCTION. HALT AT ERROR WAIT IF FAILURE OCCURS. USE THIS SETTING TO OETECT INTERMITTANT ERRORS, ANO FOR STEPPING THROUGH A FAILING ROUTINE IN SINGLE INSTRUCTION MOOE.
. .	
1 1	CONTINUOUS LOOP ON INSTRUCTION. BYPASS WAIT ON ERROR. USE SETTING TO SCOPE A FAILING INSTRUCTION.

A OESCRIPTION OF ALL THE WAITS FOLLOWS-

```
*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
*    HEADER TEST 1 WAITS.       *
*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
```

*

B-REG	ERROR WAIT COMMENTS
3004	MDX BY 1 FAILED
3005	MDX BY 2 FAILED
3006	MDX BY 2 FAILED
3007	MDX BY 4 FAILED
3008	MDX BY 4 FAILED
3009	MDX BY 4 FAILED
300A	MDX BY 4 FAILED
300B	MDX BY -2 FAILED
300C	MDX BY -2 FAILED
300D	MDX BY -2 FAILED
300E	MDX BY -2 FAILED
300F	MDX BY 8 FAILED
3010	MDX BY 8 FAILED
3011	MDX BY 8 FAILED
3012	MDX BY 8 FAILED
3013	BSC-CARRY FAILED
3014	BSC-OVERFLOW FAILED
3015	BSC-OVERFLOW SKIPPED, SHOULD NOT HAVE
~~3016~~	~~BSC-CARRY SKIPPED, SHOULD NOT HAVE~~
3017	LD ACC TO 0 FAILED
3018	LD ACC TO 0 FAILED
3019	BSC ON EVEN FAILED
301A	LOAD ACC. FAILED OR BSC ON NEG. FAILED
301B	BSC ON PLUS SKIPPED, SHOULD NOT HAVE
301C	BSC ON EVEN SKIPPED, SHOULD NOT HAVE
301D	ACC NOT # 7FFF
301E	ACC NOT # 3FFF
301F	ACC NOT # 1FFF
3020	ACC NOT # 0FFF
3021	ACC NOT # 07FF
3022	ACC NOT # 03FF
3023	ACC NOT # 01FF
3024	ACC NOT # 00FF
3025	ACC NOT # 007F
3026	ACC NOT # 003F
3027	ACC NOT # 001F
3028	ACC NOT # 000F
3029	ACC NOT # 0007
302A	ACC NOT # 0003
302B	ACC NOT # 0001
302C	ACC NOT # 0000
302D	ACC NOT # 0000
302E	ACC NOT # FFFF
302F	ACC NOT # FFFF
3030	ACC NOT # 7FFF
3031	ACC NOT # 3FFF
3032	ACC NOT # 1FFF
3033	ACC NOT # 0FFF
3034	ACC NOT # 07FF
3035	ACC NOT # 03FF
3036	ACC NOT # 01FF
3037	ACC NOT # 00FF
3038	ACC NOT # 007F
3039	ACC NOT # 003F
303A	ACC NOT # 001F
303B	ACC NOT # 000F
303C	ACC NOT # 0007
303D	ACC NOT # 0003

303E	ACC NOT # 0001
303F	ACC NOT # 0000
3040	ACC NOT # 0000
3041	ACC NOT # ZERO
3042	ACC NOT # FFFF
3043	ACC NOT # ZERO
3044	EOR OF 0 AND 0 FAILED
3045	EOR OF 1 AND 1 FAILED
3046	EOR OF 1 AND 0 FAILED
3047	EOR OF 1 AND 0 FAILED
3048	EOR OF 0 AND 1 FAILED
3049	EOR OF 0 AND 1 FAILED
304A	WRONG LOCATION LOADED
304B	WRONG LOCATION LOADED
304C	WRONG LOCATION LOADED
304D	WRONG LOCATION LOADED
304E	BSC FELL THROUGH
304F	BSC SKIPPED, SHOULD OF BRANCHED
3050	BSC E FELL THROUGH
3051	BSC SKIPPED, SHOULD OF BRANCHED
3052	BSC & FELL THROUGH
3053	BSC SKIPPED, SHOULD OF BRANCHED
3054	BSC Z FELL THROUGH
3055	BSC SKIPPED, SHOULD OF BRANCHED
3056	BSC SKIPPED, SHOULD NOT OF BRANCHED
3057	C FELL THROUGH
3058	BSC SKIPPED, SHOULD OF BRANCHED
3059	BSC O FELL THROUGH
305A	BSC SKIPPED, SHOULD OF BRANCHED
305B	BSC BRANCHED, SHOULD NOT OF BRANCHED
305C	BSC BRANCHED, SHOULD NOT OF BRANCHED
305E	BSC BRANCH ZERO FAILED, NOT PLUS OR NEG.
305F	BSC SKIPPED, SHOULD OF BRANCHED
3060	BSC BRANCHED NEG., SHOULD NOT HAVE
3061	BSC BRANCHED PLUS, SHOULLD NOT HAVE
3062	INDIRECT BSC FAILED
3063	INDIRECT BSC FAILED

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*    HEADER TEST 2 WAITS.       *
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B-REG	ERROR WAITS COMMENTS
3064	BSI SKIPPED, SHOULD OF BRANCHED
3065	BSI FAILED TO STORE PROPER I REG
3066	BSI PLUS FELL THROUGH
3067	BSI SKIPPED, SHOULD OF BRANCHED
3068	BSI FAILED TO STORE PROPER I REG
3069	STORE FAILED
306E	SRA 16 FAILED
306F	SRA 15 FAILED
3070	SRA 1 FAILED
3071	SRA 1 FAILED
3072	MULTIPLE SRA'S FAILED
3073	AND OF 0 AND 0 FAILED
3074	AND OF 0 AND 1 FAILED
3075	AND OF 1 AND 0 FAILED
3076	AND OF 1 AND 1 FAILED
3077	OR OF 0 AND 0 FAILED
3078	OR OF 0 AND 1 FAILED
3079	OR OF 1 AND 1 FAILED
307A	ACC DESTROYED AFTER MDX ADD MEM.
307B	ADD TO MEM FAILED

307C	RTE ZEROS FROM A TO Q FAILED
307D	RTE ONES FROM A TO Q FAILED
307E	SRT 32-A REG FAILED
307F	SRT 32-Q REG FAILED
30B0	SRT 32-A REG FAILED
30B1	SRT 32-Q REG FAILED
30B2	SRT 15-A REG FAILED
3083	SRT 15-Q REG FAILED
3084	MULTIPLE SRT'S FAILED
30B5	MULTIPLE SRT'S FAILED

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* HEADER TEST 3 WAITS. *
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B-REG	ERROR WAITS COMMENTS
30B6	RTE 15-Q TO A FAILED
30B7	RTE 15-A TO Q FAILED
3088	MULTIPLE RTE'S FAILED
3089	MULTIPLE RTE'S FAILED
30BA	SLA 16-CARRY FAILED
30BB	SLA 16-AFFECTED Q RED
30BC	SLA 16-CARRY FAILED
30BD	SLA 16-AFFECTED Q REG
308E	SLA 1-CARRY FAILED
308F	SRA 1-AFFECTED Q REG
3090	SLA 1-CARRY FAILED
3091	SLA 1-AFFECTED Q REG
3092	MULTIPLE SRA'S & CARRY FAILED
3093	MULTIPLE SRA'S AFFECTED Q REG
3094	SLT 32-CARRY FAILED
3095	SLT 32-Q REG FAILED
3096	SLT 16-CARRY FAILED
3097	SLT 16-Q REG FAILED
3098	SLT 15-CARRY FAILED
3099	SLT 15-Q REG FAILED
309A	MULTIPLE SLT'S & CARRY FAILED
309B	MULTIPLE SLT'S AFFECTED Q REG
309C	STORE ZEROS FAILED
309D	STORE ONES FAILED
309E	STS FAILED TO STORE
309F	LOST ACC DATA AFTER LDS-STS
30A0	STS NOT CLEAR CARRY
30A1	STS NOT CLEAR OVERFLW
30A2	STS FAILED TO STORE
30A3	STS FAILED TO STORE
30A4	STS NOT CLEAR CARRY
30A5	STS FAILED TO STORE
30A6	STS NOT CLEAR OVERFLOW

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* HEADER TEST 4 WAITS. *
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B-REG	ERROR WAITS COMMENTS
30A7	BSC SKIPPED, SHOULD NOT HAVE
30AB	BSC SKIPPED, SHOULD NOT HAVE
30A9	BSC FAILED TO SKIP
30AA	BSC NOT CLEAR OVERFLW
30AB	BSC FAILED TO SKIP
30AC	BSC FELL THRU
30AD	BSC SKIPPED, SHOULD DF BRANCHED
30AE	ACC DESTROYED AFTER LOAD-TEST-EOR
30AF	BSC FELL THRU
30B0	BSC SKIPPED, SHOULD OF BRANCHED
30B1	BSC SKIPPED, SHOULD NOT OF BRANCHED
30B2	BSC BRANCHED, SHOULD NOT DF BRANCHED
30B3	BSC PLUS CLEARED OVERFLDW
30B4	BSC FAILED TO SKIP
30B5	BSI FELL THRU
30B6	BSI SKIPPED, SHOULD OF BRANCHED
30B7	BSI DID NOT CLEAR OFL
30BB	BSI FELL THROUGH
30B9	BSI SKIPPED, SHOULD OF BRANCHED
30BA	BSI BRANCHED, SHOULD NOT OF BRANCHED
30BB	BSI BRANCHED, SHOULD NOT DF BRANCHED
30BC	BSI BRANCHED, SHOULD NOT OF BRANCHED
30BD	BSI BRANCHED, SHOULD NOT OF BRANCHED
30BE	BSI BRANCHED, SHOULD NOT OF BRANCHED
30BF	BSI BRANCHED, SHOULD NOT OF BRANCHED
30C0	TAG REG BIT 7 FAILED INDEX 1
30C1	TAG REG BIT 6 FAILED INDEX 2
30C2	TAG BIT 6 OR 7 FAILED INDEX 3
30C3	IX 1 NOT LOADED
30C4	IX 2 NOT LOADED
30C5	IX 3 NOT LOADED
30C6	IX 1 NOT LOADED
30C7	IX 2 NOT LOADED
30C8	IX 3 NOT LOADED

HEADER TEST 5 WAITS.

8-REG	ERROR WAITS COMMENTS
30C9	LONG FORM LDX-FAILED
30CA	LONG LDX FAILED
30C8	LONG LDX FAILED
30CC	INDIRECT LDX FAILED
30CD	INDIRECT LDX FAILED
30CE	INDIRECT LDX FAILED
30CF	ACC GONE AFTER STX
30D0	IX 1 NOT STORED
30D1	IX 2 NOT STORED
30D2	IX 3 NOT STORED
30D3	IX 1 NOT STORED
30D4	IX 2 NOT STORED
30D5	IX 3 NOT STORED
30D6	IX 1 FAILED TO SKIP
30D7	IX2 CHANGED
30D8	IX3 CHANGED
30D9	IX2 FAILED TO SKIP
30DB	IX3 CHANGED
30DC	IX3 FAILED TO SKIP
30DD	IX1 CHANGED
30DE	IX2 CHANGED
30DF	WRONG DECODE OF ACC
30E0	WRONG DECODE OF ACC
30E1	WRONG DECODE OF ACC
30E2	OVERFLOW IS ON
30E3	CARRY NOT ON OR ADD 0001 + FFFF FAILED
30E4	CARRY NOT ON OR ADD FFFF + FFFF FAILED
30E5	OVERFLOW NOT ON OR ADD 4000 + 4000 FAILED ADD 4000 + 4000 FAILED
30E6	ADD 8000 + 8000 FAILED
30E7	OVERFLOW NOT ON
30E8	CARRY NOT ON

HEADER TEST 6 WAITS.

B-REG	ERROR WAITS COMMENTS
30E9	WRONG LOCATION
30EA	IX 1 LOADED WRONG
30E8	WRONG LOCATION
30EC	IX 2 LOADED WRONG
30ED	WRONG LOCATION
30EE	IX 3 LOADED WRONG
30EF	WRONG LOCATION
30F0	IX 3 LOADED WRONG
30F1	WRONG LOCATION
30F2	IX 3-LOADED WRONG
30F3	SHORT INDEX FAILED
30F4	SHORT INDEX FAILED
30F5	SHORT INDEX FAILED
30F6	INDEXED SLA FAILED
30F7	INDEXED SRA FAILED
30F8	INDEXED 8SC FAILED
30F9	8SC INDIRECT FAILED
30FA	0001 MINUS 0000 FAIL
30F8	CARRY NOT ON
30FC	FFFF MINUS 0000 FAIL
30FD	CARRY NOT SET
30FE	0001 MINUS 8000 FAIL
30FF	OVERFLOW NOT SET
3100	8000 MINUS 0000 FAIL
3101	CARRY NOT ON
3102	OVERFLOW NOT ON
3103	IX1 FAILED TO SKIP
3104	MDX IX1 FAILED
3105	MDX LONG IX 2 FAILED
3106	IX 3 NO SKIP AT 0
3107	SIGN CHANGE-NO SKIP
3108	ACC GONE AFTER MDX I
3109	INDIRECT MDX FAILED
310A	MDX L FAILED TO SKIP
3108	MDX L SKIPPED-ERROR